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## FRANKENFIELD ON THE 1927 FLOODS IN THE MISSISSIPPI VALLEY[1]

By A. J. HENRY

### CAUSES OF FLOODS OF 1927

During the second week of August, 1926, a period of general rains set in over the portion of the central drainage basin of the Mississippi River, extending from eastern Kansas and eastern Oklahoma east-northeastward throughout the Ohio Valley. By the end of that month the soil over that area was well saturated with moisture and the continuance of heavy rains through September and early October caused general floods except in the Ohio where flood stages were not reached although high water prevailed. In portions of the Neosho Valley of Kansas and in the lower Illinois Valley the floods were the greatest and most disastrous of record, and it was not until November 20 that the entire Illinois River had fallen below flood stage. The foundation was thus so well laid that neither prophetic vision nor vivid imagination was required to picture a great flood in the following spring, contingent only upon a rainfall substantially above the normal during the winter months. October, November, and early December are normally the months of lowest water in the rivers of the United States, yet in October and November, 1926, nearly all of the main and tributary rivers below the mouth of the Platte and Des Moines Rivers were well above the normal stages for the season, with the channels of many of the larger streams filled to at least 50 per cent of their natural capacity. While there may have been some room for speculation even as late as December 15, the great flood in the Tennessee and the record-breaking flood in the Cumberland of late December, 1926, and early January, 1927, left no further opportunity for doubt. There *would* be a lower Mississippi flood and probably an Ohio flood, and its extent would be measured only by the quantity of winter rainfall and its distribution in time and space.

Since the lower Mississippi flood of 1922 up to that time the highest of record from the mouth of the Arkansas southward the mean stages for October and November and the first 15 days of December, 1912, 1921, and 1926, for a number of representative stations have been set forth in Table 1. The period was ended with December 15 as the first heavy rains set in a few days later.

A cursory inspection of this table will show clearly that with winter rainfall in excess to only a moderate degree, a flood equalling or exceeding that of 1922 might reasonably be expected in the spring of 1927. The figures for 1912, a year of large flood were added with the idea of affording further illumination in connection with the question of the possible maximum flood of the future.

The outstanding features of the above table are the large 1926 excesses in stage in the Mississippi below the mouth of the Missouri, and in the Illinois, lower Arkansas and lower White Rivers, the relatively large excesses in the Mississippi at Hannibal, Mo. Note also at this time for later reference in connection with future flood possibilities that the excess in the Ohio above Paducah was not very significant. On the whole, however, the antecedent conditions in the autumn of 1926, by reason of the much higher stages over the major portion of the potential flood area, were at least suggestive of as great a flood in the spring of 1927 as in the spring of 1922. Their relative magnitude could be determined only by the amount and distribution of the winter rains over the great central valleys.

TABLE 1.—*Average river stages October 1 to December 15, 1912, 1921, and 1926*

| Station | River | Flood stage | 1926 | 1912 | Excess, 1926 over 1912 | 1921 | Excess, 1926 over 1921 |
|---|---|---|---|---|---|---|---|
| | | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* |
| Pittsburgh, Pa. | Ohio | [1] 25 | 14.6 | 6.3 | 8.3 | 11.4 | 3.2 |
| Cincinnati, Ohio | do | 52 | 24.9 | 12.2 | 12.7 | 20.8 | 4.1 |
| Evansville, Ind. | do | 35 | 22.0 | 14.3 | 7.7 | 17.3 | 4.7 |
| Nashville, Tenn. | Cumberland | 40 | 14.2 | 6.1 | 8.1 | 11.9 | 2.3 |
| Johnsonville, Tenn. | Tennessee | 31 | 5.0 | 1.9 | 3.1 | 4.8 | 0.2 |
| Paducah, Ky. | Ohio | 43 | 21.7 | 16.0 | 5.7 | 14.8 | 6.9 |
| Cairo, Ill. | do | 45 | 31.6 | 18.9 | 12.7 | 21.2 | 10.4 |
| Hannibal, Mo. | Mississippi | 13 | 9.0 | 5.5 | 3.5 | 4.0 | 5.0 |
| Beardstown, Ill. | Illinois | 14 | 20.3 | | | 10.4 | 9.9 |
| Tuscumbia, Mo. | Osage | 25 | 10.6 | | | 4.1 | 6.5 |
| Hermann, Mo. | Missouri | 21 | 10.8 | 4.5 | 6.3 | 5.4 | 5.4 |
| St. Louis, Mo. | Mississippi | 30 | 18.2 | 10.8 | 7.4 | 6.1 | 12.1 |
| New Madrid, Mo. | do | 34 | 24.3 | 16.6 | 7.7 | 15.2 | 9.1 |
| Memphis, Tenn. | do | 35 | 23.8 | 14.4 | 9.4 | 13.7 | 10.1 |
| Helena, Ark. | do | 42 | 30.0 | 20.8 | 9.2 | 16.9 | 13.1 |
| Clarendon, Ark. | White | 30 | 22.0 | 13.0 | 9.0 | 12.5 | 9.5 |
| Pine Bluff, Ark. | Arkansas | 25 | 14.4 | 7.9 | 6.5 | 5.7 | 8.7 |
| Arkansas City, Ark. | Mississippi | 48 | 35.1 | 23.9 | 11.2 | 18.9 | 16.2 |
| Vicksburg, Miss. | do | 45 | 32.8 | 24.3 | 8.5 | 16.6 | 16.2 |
| Alexandria, La. | Red | 36 | 12.1 | 11.6 | 0.5 | 3.9 | 8.2 |
| Monroe, La. | Ouachita | 40 | 13.9 | 11.2 | 2.7 | 5.1 | 8.8 |
| Baton Rouge, La. | Mississippi | 35 | 22.7 | 16.4 | 6.3 | 9.5 | 13.2 |
| New Orleans, La. | do | 17 | 9.6 | 7.4 | 2.2 | 3.3 | 6.3 |
| Melville, La. | Atchafalaya | 37 | 26.3 | 15.8 | 10.5 | 13.8 | 12.5 |

[1] On Mar. 1, 1926, the zero mark of the river gage at Pittsburgh, Pa., on the Ohio River was lowered from 697.2 to 694 feet above mean sea level in order that the recorded stages might show the actual height of the water above the bottom of the pool created by the fixed dam 6 miles downstream at Emsworth, Pa. This necessitated a correction of plus 3.2 feet to all gage records previous to Mar. 1, 1926, and this correction should be applied to all data for Pittsburgh previously published. The highest authenticated stage at Pittsburgh will therefore be 41.1 feet on Jan. 9, 1763, and the next 39.2 feet on Jan. 9, 1762. Flood stage at Pittsburgh is now 25 feet. On Feb. 10, 1832, the crest stage was 38.2 feet, and during this flood the Ohio River at Cincinnati reached a stage of 64.2 feet on Feb. 19, flood stage being at 52 feet.

*Snow cover.*—As in 1922, it appears that the influence of melted snow upon the floods of 1927 was negligible. During the Ohio flood of the third week of January, 1927, there was melting of an average cover of perhaps 4 or 5 inches north of the Ohio, but the total water contributed to the main streams could not have exceeded one-half inch, and by the end of February there was no remaining snow of consequence over any portion of the Mississippi drainage except over high mountains, and these conditions prevailed quite generally during March.

*Flood increments.*—As the flood of 1927 below the mouth of the Yazoo represented the total effect not only of the original great flood but also that of several other important but less decided rises, an attempt has been made to show in one table the stages and dates of these secondary rises. (See Table 2.)

[1] Condensed from the full report, Mo. Wea. Rev. Supplement No. 29, by H. C. Frankenfield and others. Copies of this report can be had from the Superintendent of Documents, Government Printing Office, Washington, D. C., at the price of 25 cents.

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TABLE 2.—*Flood crests, with dates, for 1927, in chronological order*

| Station | River | Flood stage | Crest | | Lowest between crests | | Crest | | Lowest between crests | | Crest | | Lowest between crests | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height | Date | Height | Date | Height | Date | Height | Date | Height | Date | Height | Date |
| | | *Feet* | *Feet* | | *Feet* | | *Feet* | | *Feet* | | *Feet* | | *Feet* | |
| Cincinnati, Ohio | Ohio | 52 | 46.3 | Dec. 29 | 11.7 | Jan. 15 | 59.1 | Jan. 25 | 27.4 | Feb. 17 | 46.8 | Feb. 27 | 21.9 | Mar. 9. |
| Nashville, Tenn | Cumberland | 40 | 56.2 | Jan. 1 | 8.8 | Jan. 18 | 31.5 | Feb. 4 | 16.5 | Feb. 15 | 31.4 | do | 14.6 | Mar. 7. |
| Johnsonville, Tenn | Tennessee | 31 | 41.0 | Jan. 3-4 | 6.9 | Jan. 19-20 | 20.2 | Feb. 7 | 15.8 | Feb. 13-14 | 25.4 | Mar. 4 | 20.4 | Mar. 7. |
| Paducah, Ky | Ohio | 43 | 46.8 | Jan. 6 | 15.6 | Jan. 18-19 | 44.2 | Feb. 6 | 31.7 | Feb. 24 | 37.0 | Mar. 4-5 | 33.4 | Mar. 11. |
| Cairo, Ill | do | 45 | 48.9 | Jan. 7 | 23.6 | Jan. 18 | 48.9 | Feb. 6-7 | 38.0 | Feb. 25 | 41.7 | Mar. 5-6 | 39.0 | Mar. 11-12. |
| St. Louis, Mo | Mississippi | 30 | | | | | 17.1 | Feb. 10-11 | 11.0 | Mar. 7 | | | | |
| New Madrid, Mo | do | 34 | 37.5 | Jan. 8-9 | 18.3 | Jan. 19 | 37.6 | Feb. 8 | 29.3 | Feb. 26 | 32.1 | Mar. 6-7 | 30.2 | Mar. 12. |
| Memphis, Tenn | do | 35 | 37.7 | Jan. 12 | 20.9 | Jan. 22 | 37.8 | Feb. 12-13 | 30.3 | Mar. 1-2 | 32.7 | Mar. 9-10 | 32.4 | Mar. 11 |
| Clarendon, Ark | White | 30 | 27.7 | Jan. 3-4 | 23.8 | Jan. 20 | 32.6 | Feb. 4-5 | 23.9 | Mar. 7 | | | | |
| Helena, Ark | Mississippi | 44 | 46.3 | Jan. 15 | 31.0 | Jan. 24 | 47.3 | Feb. 15 | 39.5 | Mar. 5-6 | | | | |
| Little Rock, Ark | Arkansas | 23 | 20.5 | Jan. 26 | | | | | 4.0 | Feb. 28-Mar. 1. | | | | |
| Arkansas City, Ark | Mississippi | 48 | 48.7 | Jan. 18 | 42.2 | Jan. 26 | 51.8 | Feb. 17-19 | 45.3 | Mar. 8-10 | | | | |
| Greenville, Miss | do | 42 | 41.7 | Jan. 19 | 35.8 | Jan. 27 | 44.8 | Feb. 17-20 | 38.4 | Mar. 8-11 | | | | |
| Yazoo City, Miss | Yazoo | 25 | 30.4 | Jan. 21 | 28.3 | Feb. 10-11 | 29.9 | Feb. 18 | 28.1 | Mar. 7-8 | | | | |
| Vicksburg, Miss | Mississippi | 45 | 46.5 | do | 43.3 | Jan. 30-31 | 49.5 | Feb. 21-24 | 45.9 | Mar. 12 | | | | |
| Natchez, Miss | do | 46 | 45.4 | Jan. 22-24 | 43.4 | Jan. 31-Feb. 2. | 49.5 | Feb. 23-27 | 46.7 | Mar. 16-18 | | | | |
| Alexandria, La | Red | 36 | 32.7 | Jan. 1-2 | 18.4 | Jan. 19 | 30.6 | Feb. 3-4 | 20.3 | Mar. 3 | | | | |
| Monroe, La | Ouachita | 40 | 34.3 | Jan. 12-14 | 32.0 | Feb. 3-5 | 35.2 | Feb. 20-22 | 32.6 | Mar. 7 | 40.9 | Mar. 28 | 40.1 | Apr. 8. |
| Baton Rouge, La | Mississippi | 35 | 34.8 | Jan. 26 | 33.7 | do | 39.0 | Feb. 28 | 37.2 | Mar. 18-19 | | | | |
| Donaldsonville, La | do | 28 | 27.7 | do | 26.5 | Feb. 3-4 | 31.1 | Mar. 1 | 29.4 | Mar. 17-20 | | | | |
| New Orleans, La | do | 17 | 16.6 | Jan. 24-27 | 16.0 | Feb. 3-6 | 18.8 | do | 17.7 | Mar. 14-20 | | | | |
| Melville, La | Atchafalaya | 37 | 35.8 | Jan. 26-29 | 35.5 | Feb. 1-5 | 39.0 | Feb. 28-Mar. 2. | 38.5 | Mar. 12-13 | | | | |

| Station | River | Flood stage | Crest | | Lowest between crests | | Crest | | Lowest between crests | | Crest | | Lowest between crests | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height | Date | Height | Date | Height | Date | Height | Date | Height | Date | Height | Date |
| | | *Feet* | *Feet* | | *Feet* | | *Feet* | | *Feet* | | *Feet* | | *Feet* | |
| Cincinnati, Ohio | Ohio | 52 | 33.1 | Mar. 14 | | | 46.0 | Mar. 26 | 27.3 | Apr. 1 | 39.3 | Apr. 13 | 22.3 | Apr. 29. |
| Nashville, Tenn | Cumberland | 40 | 40.0 | do | 11.6 | Mar. 31 | | | | | 30.4 | Apr. 14 | 10.5 | May 5. |
| Johnsonville, Tenn | Tennessee | 31 | 36.3 | Mar. 16 | 12.5 | Mar. 30-31 | | | | | 32.0 | Apr. 17 | 15.4 | Apr. 27. |
| Paducah, Ky | Ohio | 43 | 44.6 | Mar. 25 | 41.4 | Mar. 31 | | | | | 47.2 | Apr. 18 | 30.9 | May 9. |
| Cairo, Ill | do | 45 | 52.8 | Mar. 25 | 49.2 | do | | | | | 50.4 | Apr. 20 | 41.8 | Do. |
| Kansas City, Mo | Missouri | 22 | 11.4 | Mar. 22 | 9.7 | Mar. 26 | 15.0 | Apr. 2 | 12.6 | Apr. 7 | 24.8 | Apr. 21 | 15.3 | Apr. 29. |
| Hannibal, Mo | Mississippi | 13 | | | | | 16.5 | Apr. 4 | 13.8 | Apr. 10 | 18.0 | Apr. 22 | 10.7 | May 9. |
| St. Louis, Mo | do | 30 | 27.3 | Mar. 21-22 | 20.3 | Mar. 31 | 31.0 | Apr. 5 | 28.2 | do | 36.1 | Apr. 26 | 23.7 | May 7. |
| New Madrid, Mo | do | 34 | 40.4 | Mar. 25-26 | 38.4 | Apr. 1-2 | | | | | 43.5 | Apr. 21-22 | 34.1 | May 10. |
| Memphis, Tenn | do | 35 | 41.4 | Mar. 30 | 39.8 | Apr. 5 | | | | | 46.0 | Apr. 23 | | |
| Clarendon, Ark | White | 30 | | | | | 28.9 | Apr. 1-2 | 28.5 | Apr. 7-8 | 43.3 | do | | |
| Helena, Ark | Mississippi | 44 | 51.0 | Apr. 1-2 | 50.5 | Apr. 6-8 | | | | | 56.75 | Apr. 26-27 | | |
| Little Rock, Ark | Arkansas | 23 | | | | | 17.5 | Mar. 25 | 7.5 | Apr. 1-2 | 33.0 | Apr. 20 | 13.0 | May 9. |
| Arkansas City, Ark | Mississippi | 48 | | | | | | | | | 60.5 | Apr. 21 | | |
| Greenville, Miss | do | 42 | | | | | | | | | 54.7 | do | | |
| Vicksburg, Miss | do | 45 | | | | | | | | | 58.7 | May 4 | | |
| Natchez, Miss | do | 46 | | | | | | | | | 56.5 | May 1-4 | | |
| Alexandria, La | Red | 36 | | | | | 34.6 | Mar. 17-19 | 23.9 | Apr. 5 | 42.4 | May 8 | | |
| Monroe, La | Ouachita | 40 | | | | | | | | | 48.2 | May 4 | | |
| Baton Rouge, La | Mississippi | 35 | | | | | | | | | 47.8 | May 15 | | |
| Donaldsonville, La | do | 28 | | | | | | | | | 37.1 | May 15-17 | | |
| New Orleans, La | do | 17 | 21.0 | Apr. 25 | 20.2 | May 10 | | | | | 20.7 | May 15 | | |
| Melville, La | Atchafalaya | 37 | | | | | | | | | 46.8 | May 14-16 | | |

| Station | River | Flood stage | Crest | | Lowest between crests | | Crest | | Lowest between crests | | Crest | | Lowest between crests | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height | Date | Height | Date | Height | Date | Height | Date | Height | Date | Height | Date |
| | | *Feet* | *Feet* | | *Feet* | | *Feet* | | *Feet* | | *Feet* | | *Feet* | |
| Cincinnati, Ohio | Ohio | 52 | 32.9 | May 5 | 17.0 | May 17 | 35.0 | May 24 | 25.0 | May 29 | 31.3 | June 2 | 16.3 | June 15. |
| Nashville, Tenn | Cumberland | 40 | | | | | | | | | 26.9 | June 4 | 9.9 | June 17. |
| Johnsonville, Tenn | Tennessee | 31 | | | | | | | | | 15.8 | June 7 | | |
| Paducah, Ky | Ohio | 43 | 32.5 | May 14 | 23.4 | May 22 | | | | | 39.9 | June 8 | | |
| Cairo, Ill | do | 45 | 44.0 | do | 36.4 | May 22-23 | | | | | 49.7 | do | | |
| Kansas City, Mo | Missouri | 22 | 21.8 | May 18 | 14.5 | May 27-28 | | | | | | | | |
| Hannibal, Mo | Mississippi | 13 | 15.7 | May 26 | 13.9 | June 2 | | | | | 17.0 | June 6 | | |
| St. Louis, Mo | do | 30 | 30.3 | May 11 | 24.9 | May 24 | | | | | | | | |
| New Madrid, Mo | do | 34 | 34.8 | May 14-15 | 29.4 | do | | | | | 39.4 | June 10-11 | | |
| Memphis, Tenn | do | 35 | | | 30.7 | May 27 | | | | | 39.0 | June 14-15 | | |
| Clarendon, Ark | White | 30 | | | 28.0 | May 25-26 | | | | | 29.3 | June 15-16 | | |
| Helena, Ark | Mississippi | 44 | | | 40.9 | May 30-31 | | | | | 48.0 | June 16-18 | | |
| Little Rock, Ark | Arkansas | 23 | 17.0 | May 12 | 9.8 | May 20 | | | | | 19.8 | June 25 | | |
| Arkansas City, Ark | Mississippi | 48 | | | 43.4 | June 3-4 | | | | | 45.4 | June 20-22 | | |
| Greenville, Miss | do | 42 | | | 36.9 | June 1 | | | | | 38.6 | June 20-21 | | |
| Yazoo City, Miss | Yazoo | 25 | 37.4 | June 5 | | | | | | | | | | |
| Vicksburg, Miss | Mississippi | 45 | | | 47.4 | June 12-14 | | | | | 48.7 | June 25-28 | | |
| Natchez, Miss | do | 46 | | | 47.6 | June 16-21 | | | | | 47.9 | June 26 | | |
| Alexandria, La | Red | 36 | | | 16.1 | June 20 | | | | | 21.4 | June 26-27 | | |

It so happened that owing to numerous crevasses, these supplementary rises did not result in increased crests in the lower river, yet they served to prolong the flood below and, what was much more unfortunate, to reinundate large areas from which the waters had receded and in much of which crops had been planted.

*Rainfall and flood progress.*—As the progress of a flood depends almost entirely upon the amount of precipitation, its distribution in time and space, another table has been prepared showing the amount of precipitation by weeks over the entire drainage area, beginning with December 18, 1926, and ending with April 30, 1927. (See Table 3.)

*December, 1926.*—The December rains were especially heavy over Kentucky and Tennessee, averaging 9.25 inches over the basin of the Cumberland and somewhat less over the Tennessee basin. The result was the greatest flood of record in the Cumberland, a near-great flood in the Tennessee and Green Rivers and a decided rise in the Ohio with stages from 4 to 6 feet above the flood stages below the mouth of the Green River, the crest passing Cairo, Ill., on January 7, 1927.

Heavy rains also fell during the last two weeks of December over Mississippi and Arkansas but not over Louisiana, so that with only moderate support below Cairo from the White and Ouichita Rivers the flood finally passed New Orleans between January 24 and 27 without having exceeded the actual flood stages below Arkansas City, Ark., except, and only slightly, at Vicksburg, Miss.

*January, 1927.*—After the end of December there were no rains of much consequence until the third and fourth weeks of January, when there was a moderate to heavy fall over the Ohio Valley, the rains being accompanied by high temperatures that brought out water from the accumulated snow. At Pittsburgh, Pa., there was a flood crest of 29.7 feet on January 23, and at Cincinnati, Ohio, one of 59.1 on January 25. This flood received considerable support from the northern tributaries, but not so much from the southern ones, and the crest of 48.9 feet at Cairo on February 6 and 7 was exactly the same as that of January 7, while the crest of 44.2 feet at Paducah, Ky., was 2.6 feet lower than that of January 6.

Below Cairo there was considerable support received from the Arkansas, lower Red and Ouichita River, although without heavy February rains, and the crests in the main streams, except at New Orleans, were from 3 to 4 feet higher than during the January flood. At New Orleans on March 1 the crest was 18.8 feet, or 1.8 feet above flood stage. This flood crest required 38 days to travel from Pittsburgh to New Orleans, while the January crest required but 29 days. The season was advancing and between the two rises there was sufficient rainfall to hold the water at the comparatively high stages that are normal to the winter season in the lower Mississippi.

*February, 1927.*—Heavy rains fell over the Ohio and Red Basins during the week February 12–19. Over the Ohio Basin there was sufficient rise to bring the river at Cairo to a crest of 41.7 feet on March 5–6, from a low point of 38 feet on February 25.

Up to about March 15 there had been no high-water in the Missouri Basin, but little in the Mississippi above the mouth of the Ohio except in the Illinois and little, if any, more in the Arkansas Basin, while the Ohio between crests was holding at quite high stages, as was also the Yazoo, Ouichita, and Red, including the Atchafalaya, which at Mellville, La., had not been below 35 feet since January 19.

*March, 1927.*—During the last half of March rain much in excess of normal fell over the Mississippi Basin between the mouth of the Des Moines and the mouth of the Ohio, and during the last week over the Missouri Basin below Omaha, especially over the Kansas and Osage sub-basins. There was also a 14-day period of heavy rains over the Ohio Basin from March 12–25, heaviest over western Kentucky, western Tennessee, southern Indiana and Illinois; a seven-day period, March 12–18, over the lower Mississippi Basin, and moderate rains during the last half of the month over the Arkansas and Red Basins. The rivers were too high to be materially influenced by the rains of March 12–18, but those of the following week supplied the necessary stimulus and a general rise set in below the mouth of the Missouri. The Osage River was also in flood for a few days of the fourth week of the month Owing to irregular rainfall distribution the rise in the Ohio was likewise irregular above the mouth of the Green, but the last named and the lower Tennessee were both in flood and flood stages were once more passed below the mouth of the Green, the crests occurring nearly at the same time throughout this reach of the river.

At Cairo the crest stage of 52.8 feet on March 25 apparently received some assistance from the upper Mississippi as St. Louis reported a crest of 27.3 feet on March 21–22. This rise did not extend down the Mississippi much below Helena, Ark., where there was a crest of 51 feet on April 1–2; nevertheless, from the mouth of the Arkansas southward the river had been rising steadily, beginning with March 11 at Arkansas City and the rise from above was too small to affect it other than perhaps to increase the rate of rise somewhat and to prolong the flood wave.

*April, 1927.*—The month of April showed a general excess of rain over the entire drainage area, the major portion occurring during the first three weeks. Over the upper Mississippi Basin the excess was not large, but over the Missouri it was quite pronounced, especially during the week of April 9–15. Below the mouth of the Ohio the rains were heaviest during the 14 days, April 9–22, with very heavy falls over the Arkansas Basin. Over the Red Basin the heaviest fall occurred during the week April 9–15 and a week later over the lower Mississippi Basin. As these rains fell it became apparent that the real flood was yet to come and that it would certainly prove to be the greatest of all floods from Cairo southward. While the Ohio above the mouth of the Green did not again reach flood stages, there was a decided rise, the Green and Wabash Rivers were well above flood stages, the upper Mississippi below the mouth of the Des Moines was in moderate flood, with another and greater one to follow; the Missouri from Kansas City east was high, the St. Francis, Black, and White were in pronounced flood, and the Arkansas finally in great flood, the greatest since 1833. Farther down and a little later the Ouachita, Black, and lower Red Rivers were well above flood stage and still rising at the end of April.

TABLE 3.—*Precipitation by weeks, from December 18, 1926, to April 29, 1927*

OHIO RIVER DRAINAGE BASIN

| Station | River | Dec. 18–24 | Dec. 25–31 | Jan. 1–7 | Jan. 8–14 | Jan. 15–21 | Jan. 22–28 | Jan. 29–Feb. 4 | Feb. 5–11 | Feb. 12–18 | Feb 19–25 | Feb. 26–Mar. 4 | Mar. 5–11 | Mar. 12–18 | Mar. 19–25 | Mar. 26–Apr 1 | Apr. 2–8 | Apr. 9–15 | Apr. 16–22 | Apr. 23–29 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Warren, Pa. | Allegheny | 0.14 | 1.01 | 0.61 | 0.09 | 0.59 | 0.32 | 0.48 | 0.26 | 1.08 | 1.14 | 0.74 | 0.60 | 0.47 | 2.32 | 0.37 | 1.86 | 0.00 | 0.80 | 1.46 | 14.34 |
| Martin, Pa. | Monongahela | 0.74 | 1.62 | 0.42 | 0.25 | 1.45 | 1.58 | 0.65 | 0.46 | 0.93 | 2.52 | 0.39 | 0.48 | 0.64 | 1.88 | 0.61 | 0.61 | 0.83 | 0.26 | 0.60 | 16.92 |
| Pittsburgh, Pa. | Ohio | 0.36 | 1.16 | 0.75 | 0.23 | 1.29 | 0.88 | 0.46 | 0.71 | 0.88 | 1.95 | 0.39 | 0.36 | 0.46 | 2.15 | 0.67 | 0.96 | 0.60 | 0.58 | 0.31 | 15.15 |
| Parkersburg, W. Va. | do | 0.90 | 1.19 | 0.16 | 0.41 | 1.77 | 1.06 | 0.70 | 0.79 | 1.15 | 0.97 | 0.34 | 0.50 | 0.96 | 1.61 | 1.07 | 0.21 | 0.97 | 0.61 | 0.49 | 15.86 |
| Zanesville, Ohio | Muskingum | 0.44 | 1.39 | 0.10 | 0.35 | 1.81 | 1.15 | 0.90 | 0.26 | 0.99 | 0.81 | 0.18 | 0.27 | 1.32 | 1.66 | 1.11 | 0.30 | 0.99 | 0.20 | 0.73 | 14.96 |
| Hinton, W. Va. | Kanawha-New | 2.43 | 2.17 | 0.43 | 0.49 | 0.08 | 0.25 | 0.62 | 0.96 | 1.02 | 3.11 | 0.37 | 0.62 | 0.42 | 0.28 | 1.61 | 1.01 | 2.06 | 1.30 | 0.28 | 19.51 |
| Charleston, W. Va. | do | 2.56 | 1.38 | 0.18 | 0.61 | 1.16 | 1.24 | 1.00 | 1.27 | 0.53 | 2.27 | 0.34 | 0.90 | 0.54 | 0.64 | 1.36 | 0.87 | 1.80 | 2.04 | 0.40 | 21.09 |
| Point Pleasant, W. Va. | Ohio | 1.68 | 1.63 | 0.08 | 0.60 | 2.18 | 2.21 | 0.78 | 0.67 | 0.99 | 1.64 | 0.30 | 1.20 | 1.12 | 1.15 | 0.92 | 0.55 | 1.46 | 0.91 | 0.78 | 20.85 |
| Columbus, Ohio | Scioto | 0.59 | 1.37 | 0.05 | 0.40 | 1.90 | 1.16 | 0.66 | 0.27 | 0.57 | 0.40 | 0.16 | 0.11 | 1.63 | 2.21 | 0.74 | 0.83 | 0.66 | 0.26 | 0.88 | 14.85 |
| Chillicothe, Ohio | do | 0.85 | 1.34 | 0.07 | 0.60 | 1.55 | 1.32 | 0.67 | 1.03 | 1.10 | 0.86 | 0.20 | 0.27 | 2.06 | 2.12 | 1.36 | 0.56 | 1.23 | 0.48 | 0.74 | 18.41 |
| Portsmouth, Ohio | Ohio | 1.42 | 1.49 | 0.02 | 0.67 | 2.63 | 2.10 | 0.54 | 0.91 | 0.87 | 1.56 | 0.16 | 0.36 | 0.92 | 0.78 | 1.28 | 0.43 | 1.30 | 1.27 | 0.17 | 18.88 |
| Cincinnati, Ohio | do | 0.69 | 1.29 | T. | 0.38 | 2.53 | 1.20 | 0.60 | 0.87 | 0.51 | 0.47 | 0.05 | 0.19 | 1.58 | 1.17 | 1.01 | 0.33 | 0.65 | 1.00 | 0.46 | 14.98 |
| Dayton, Ohio | Miami | 0.66 | 1.15 | 0.03 | 0.54 | 2.26 | 1.02 | 0.53 | 0.45 | 0.53 | 0.23 | 0.22 | 0.15 | 1.15 | 2.73 | 1.13 | 1.11 | 1.16 | 0.69 | 0.96 | 16.70 |
| Madison, Ind. | Ohio | 1.37 | 1.41 | 0.00 | 0.62 | 3.19 | 1.57 | 0.35 | 0.20 | 0.22 | 0.74 | 0.15 | 0.46 | 2.67 | 2.21 | 1.08 | 0.78 | 0.75 | 0.80 | 0.02 | 18.59 |
| Frankfort, Ky. | Kentucky | 2.18 | 1.55 | T. | 0.34 | 3.11 | 3.46 | 0.86 | 0.14 | 1.31 | 1.15 | 0.22 | 0.86 | 1.31 | 1.73 | 1.72 | 0.63 | 1.24 | 1.00 | 0.00 | 22.81 |
| Louisville, Ky. | Ohio | 1.81 | 1.47 | T. | 0.51 | 3.09 | 3.74 | 0.33 | 0.12 | 0.53 | 1.32 | 0.36 | 0.75 | 2.61 | 2.04 | 1.55 | 0.63 | 0.88 | 1.16 | 0.00 | 22.90 |
| Bowling Green, Ky. | Barren | 5.77 | 2.38 | 0.14 | 0.51 | 3.79 | 2.53 | 0.63 | 0.24 | 1.40 | 0.73 | 0.67 | 1.26 | 2.95 | 3.00 | 0.87 | 1.87 | 1.35 | 0.78 | 0.00 | 30.87 |
| Woodbury, Ky. | Green | 4.43 | 1.93 | T. | 0.53 | 3.42 | 2.49 | 0.88 | 0.25 | 1.68 | 0.38 | 0.57 | 0.93 | 2.93 | 2.62 | 1.09 | 1.44 | 1.19 | 1.41 | 0.00 | 28.17 |
| Evansville, Ind. | Ohio | 1.51 | 0.76 | T. | 0.51 | 2.98 | 2.45 | 0.21 | 0.03 | 0.21 | 0.46 | 0.27 | 0.67 | 3.54 | 1.70 | 2.05 | 0.64 | 2.68 | 1.39 | 0.00 | 22.06 |
| Indianapolis, Ind. | White (W. Fork) | 0.45 | 0.91 | T. | 1.19 | 1.50 | 0.41 | 0.05 | 0.73 | 1.12 | 0.28 | 0.23 | 0.44 | 2.08 | 3.25 | 1.02 | 1.63 | 1.13 | 1.35 | 0.40 | 18.17 |
| Elliston, Ind. | do | 0.44 | 0.66 | T. | 0.78 | 2.37 | 0.94 | 0.21 | 0.15 | 0.52 | 0.36 | 0.07 | 0.58 | 1.91 | 1.69 | 1.10 | 2.36 | 0.37 | 0.92 | 0.00 | 15.43 |
| Terre Haute, Ind. | Wabash | 0.66 | 0.62 | T. | 1.65 | 0.83 | 0.48 | 0.04 | 0.43 | 0.76 | 0.60 | 0.03 | 0.51 | 1.66 | 4.27 | 1.38 | 0.51 | 1.14 | 1.19 | 0.11 | 16.87 |
| Mount Carmel, Ill. | do | 1.07 | 0.70 | 0.00 | 0.95 | 2.41 | 1.63 | 0.67 | 0.15 | 0.42 | 0.20 | 0.20 | 0.37 | 2.96 | 1.12 | 1.62 | 2.17 | 2.34 | 1.54 | 0.04 | 20.56 |
| Burnside, Ky. | Cumberland | 5.36 | 3.48 | T. | 0.44 | 0.92 | 0.92 | 1.35 | 0.67 | 1.06 | 1.47 | 0.55 | 1.68 | 0.74 | 0.99 | 1.20 | 0.83 | 1.71 | 1.55 | 0.32 | 25.24 |
| Nashville, Tenn. | do | 7.03 | 3.35 | T. | 0.23 | 1.26 | 0.96 | 1.30 | 0.82 | 2.35 | 0.60 | 0.74 | 2.09 | 3.61 | 2.09 | 1.16 | 0.58 | 3.35 | 2.64 | T. | 34.14 |
| Chattanooga, Tenn. | Tennessee | 2.42 | 4.69 | 0.00 | 0.24 | 0.56 | 0.34 | 0.62 | 0.78 | 1.93 | 1.33 | 1.70 | 2.90 | 1.50 | 0.47 | 2.34 | 0.86 | 5.13 | 0.67 | 0.00 | 28.48 |
| Decatur, Ala. | do | 2.60 | 5.55 | 0.00 | 0.30 | 1.09 | 0.77 | 0.64 | 0.75 | 2.26 | 0.40 | 0.88 | 2.40 | 1.77 | 0.35 | 0.88 | 0.29 | 2.12 | 0.89 | 0.00 | 23.94 |
| Johnsonville, Tenn. | do | 8.92 | 2.86 | 0.00 | 0.32 | 2.40 | 1.50 | 1.22 | 0.90 | 1.76 | 0.52 | 0.50 | 3.12 | 4.98 | 2.66 | 2.09 | 0.66 | 5.82 | 3.00 | 0.00 | 43.23 |
| Cairo, Ill. | Ohio | 2.25 | 1.11 | T. | 0.39 | 3.48 | 4.16 | 0.61 | 0.41 | 0.34 | 0.13 | 0.41 | 0.51 | 2.94 | 1.25 | 2.96 | 2.56 | 3.14 | 2.64 | T. | 29.29 |

UPPER MISSISSIPPI RIVER DRAINAGE BASIN

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fort Ripley, Minn. | Mississippi | 0.07 | 0.00 | 0.00 | 0.05 | 0.25 | 0.00 | T. | 0.15 | 0.23 | 0.15 | 0.00 | 0.00 | 0.40 | 0.11 | 0.30 | 1.15 | 0.51 | 1.43 | 0.00 | 4.86 |
| Mankato, Minn. | Minnesota | 0.46 | 0.00 | 0.04 | 0.07 | 0.30 | 0.00 | 0.00 | 0.53 | 0.28 | 0.00 | T | 0.28 | 0.48 | 1.05 | 0.09 | 0 94 | 1.58 | 1.22 | 0.29 | 7.61 |
| St. Paul, Minn. | Mississippi | 0.70 | T. | T. | 0.30 | 0.25 | 0.11 | 0.02 | 0.15 | 0.13 | T. | T. | 0.22 | 1.03 | 0.40 | 0.42 | 0.68 | 0.17 | 0.90 | 0.41 | 5.89 |
| Rhinelander, Wis. | Wisconsin | 0.12 | 0.06 | 0.00 | 0.16 | 0.27 | 0.24 | 0.22 | 0.27 | T. | 0.00 | 0.12 | 0.36 | 0.84 | 0.41 | 0.27 | 0.41 | 0.00 | 0.91 | 0.45 | 5.11 |
| Park Rapids, Minn. | Mississippi | 0.12 | 0.02 | 0.00 | 0.23 | 0.35 | T. | 0.46 | 0.50 | 0.13 | 0.26 | T. | T. | 0.34 | 0.30 | 0.40 | 1.00 | 0.26 | 0.45 | 0.20 | 5.02 |
| Medford, Wis. | Black | 0.17 | 0.10 | 0.00 | 0.25 | 0.20 | 0.21 | T. | 0.10 | 0.08 | 0.00 | 0.14 | 0.15 | 1.35 | 0.44 | 0.40 | 0.60 | 0.15 | 0.21 | 0.43 | 4.98 |
| Wisconsin Rapids, Wis. | Wisconsin | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 0.00 | T. | 1.07 | 0.37 | 1.10 | 0.35 | T. | 1.13 | 0.47 | 4.49 |
| Portage, Wis. | do | 0.13 | 0.06 | 0.07 | 0.31 | 0.25 | 0.13 | 0.00 | 0.05 | 0.02 | 0.00 | T. | 0.08 | 1.14 | 0.31 | 0.33 | 0.33 | 0.47 | 1.77 | 0.62 | 6.07 |
| Dubuque, Iowa | Mississippi | 0.03 | T. | 0.02 | 0.29 | 0.09 | 0.02 | 0.54 | 0.02 | 0.25 | 0.01 | 0.01 | 1.17 | 0.29 | 0.67 | 0.75 | 0.67 | 1.14 | 0.84 | 0.60 | 7.41 |
| Davenport, Iowa | do | 0.02 | T. | 0.05 | 0.53 | 0.19 | T. | T. | 1.68 | 0.50 | 0.18 | T. | 0.21 | 1.74 | 0.77 | 0.85 | 0.88 | 1.18 | 1.59 | 0.55 | 10.92 |
| Des Moines, Iowa | Des Moines | 0.35 | 0.03 | T. | 0.18 | 0.04 | 0.02 | T. | 0.56 | 0.41 | 0.22 | 0.05 | 0.37 | 0.64 | 0.64 | 2.51 | 0.64 | 2.00 | 1.03 | 0.44 | 10.13 |
| Hannibal, Mo. | Mississippi | 0.15 | 0.00 | T. | 1.13 | 0.01 | 0.42 | T. | 0.58 | 0.66 | 0.18 | 0.11 | 0.59 | 1.72 | 3.11 | 1.49 | 0.32 | 2.46 | 0.98 | 0.04 | 13.95 |
| Peoria, Ill. | Illinois | 0.27 | 0.00 | 0.03 | 1.42 | 0.11 | 0.19 | 0.01 | 1.05 | 0.61 | 1.19 | T. | 0.59 | 1.63 | 1.68 | 0.86 | 0.37 | 1.51 | 2.23 | 0.53 | 14.28 |
| Beardstown, Ill. | do | 0.37 | 0.00 | 0.02 | 0.88 | 0.00 | 0.18 | 0.00 | 0.53 | 0.45 | 0.48 | 0.06 | 0.46 | 1.90 | 3.50 | 1.22 | 1.39 | 2.97 | 1.25 | 0.03 | 15.69 |
| St. Louis, Mo. | Mississippi | 0.60 | 0.15 | T. | 2.42 | 0.64 | 0.60 | T. | 0.29 | 0.22 | 0.05 | 0.30 | 0.28 | 0.94 | 2.45 | 3.70 | 0.87 | 3.88 | 0.96 | T. | 18.35 |
| Cape Girardeau, Mo. | do | 2.04 | 0.98 | 0.00 | 0.42 | 2.78 | 3.93 | 0.52 | 0.06 | 0.44 | 0.03 | 0.42 | 0.62 | 3.78 | 1.16 | 2.68 | 1.78 | 3.40 | 2.07 | 0.02 | 27.13 |

MISSOURI RIVER DRAINAGE BASIN

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Helena, Mont. | Missouri | T. | T. | 0.03 | 0.29 | 0.43 | 0.04 | 0.05 | 0.03 | 0.14 | 0.25 | 0.02 | 0.07 | 0.37 | 0.01 | 0.30 | 0.02 | 0.06 | 0.15 | 0.03 | 2.29 |
| Sheridan, Wyo. | Tongue | 0.13 | 0.04 | T. | 0.26 | 0.40 | 0.04 | 0.00 | 0.10 | 0.19 | 0.05 | 0.06 | 0.40 | 0.27 | 0.16 | 0.16 | 0.12 | 3.04 | 1.13 | 0.02 | 6.57 |
| Miles City, Mont. | Yellowstone | 0.36 | 0.00 | 0.02 | 0.08 | 0.50 | 0.01 | T. | 0.05 | 0.05 | T. | 0.12 | 0.00 | 0.13 | 0.03 | 0.03 | 0.10 | 1.74 | 0.13 | 0.35 | 3.70 |
| Havre, Mont. | Milk | 0.21 | 0.00 | 0.24 | 0.01 | 0.31 | 0.00 | 0.17 | 0.23 | 0.13 | T. | 0.03 | T. | 0.19 | 0.15 | 0.17 | 0.33 | 0.45 | 0.40 | 0.03 | 3.05 |
| Williston, N. Dak. | Missouri | 0.43 | 0.01 | 0.33 | 0.07 | 0.16 | T. | 0.06 | 0.26 | 0.10 | 0.04 | T. | 0.13 | 0.01 | 0.10 | 0.14 | 0.02 | 0.47 | 0.46 | 0.11 | 2.90 |
| Bismark, N. Dak. | do | T. | 0.00 | T. | 0.02 | 0.16 | T. | 0.06 | 0.08 | 0.07 | 0.04 | T. | 0.44 | T. | 0.29 | 0.20 | 0.39 | 0.65 | 0.30 | T. | 2.70 |
| Pierre, S. Dak. | do | 0.00 | 0.00 | 0.00 | 0.03 | 0.23 | 0.03 | 0.01 | T. | 0.03 | 0.06 | 0.02 | 0.01 | 0.29 | 0.11 | 0.38 | 0.69 | 2.27 | 0.20 | T. | 4.36 |
| Valentine, Nebr. | Niobrara | 0.00 | T. | 0.01 | 0.27 | 0.24 | 0.03 | 0.00 | T. | 0.09 | 0.18 | 0.39 | 0.92 | 0.27 | 0.45 | 1.14 | 0.41 | 2.71 | 0.24 | 0.04 | 7.39 |
| Yankton, S. Dak. | Missouri | 0.03 | T. | 0.00 | 0.07 | 0.01 | T. | 0.43 | 0.04 | 0.41 | 0.01 | 0.05 | 1.13 | 0.44 | 0.60 | 1.50 | 0.84 | 4.04 | 0.60 | T. | 10.20 |
| Cheyenne, Wyo. | South Platte | 0.04 | 0.00 | 0.00 | 0.10 | 0.05 | T. | T. | 0.35 | 0.01 | 0.05 | 0.73 | 0.34 | 0.19 | 0.59 | 0.76 | 0.02 | 1.87 | 0.19 | 0.17 | 5.46 |
| Denver, Colo. | do | 0.31 | 0.00 | 0.00 | 0.14 | 0.04 | 0.00 | 0.00 | 0.10 | 0.01 | 0.00 | 0.24 | 0.85 | 0.38 | 0.59 | 0.44 | T. | 1.29 | 0.04 | 0.20 | 4.63 |
| Fort Morgan, Colo. | do | 0.10 | 0.00 | 0.00 | 0.00 | 0.01 | T. | 0.00 | 0.01 | T. | 0.00 | 0.46 | 0.28 | 0.07 | 0.22 | 0.33 | 0.00 | 1.33 | 0.39 | 0.34 | 3.54 |
| North Platte, Nebr. | Platte | T. | 0.00 | 0.00 | 0.04 | 0.06 | T. | 0.01 | 0.01 | 0.02 | 0.22 | 0.25 | 0.39 | 0.17 | 0.50 | 0.17 | T. | 2.96 | 0.20 | 0.06 | 5.06 |
| Omaha, Nebr. | Missouri | 0.56 | 0.10 | T. | 0.09 | 0.02 | T. | 0.21 | 0.05 | 0.58 | T. | 0.25 | 0.42 | 0.14 | 0.24 | 1.13 | 0.15 | 1.19 | 0.43 | 0.03 | 5.59 |
| Beatrice, Nebr. | Blue | 0.24 | 0.00 | 0.00 | 0.06 | T. | 0.00 | 0.25 | 0.00 | 0.70 | 0.00 | 0.55 | 0.75 | T. | 0.15 | 1.77 | 0.50 | 1.70 | 1.03 | 3.00 | 10.70 |
| Concordia, Kans. | Republican | 0.24 | 0.00 | 0.00 | 0.10 | 0.0, | 0.03 | 0.15 | 0.08 | 0.93 | 0.00 | 0.25 | 0.79 | T. | 0.06 | 1.40 | 0.14 | 2.15 | 0.74 | 0.76 | 7.89 |
| Beloit, Kans. | Solomon | 0.14 | 0.00 | 0.00 | 0.06 | 0.03 | T. | 0.09 | 0.06 | 0.71 | 0.00 | 0.37 | 0.19 | 0.73 | 0.07 | 0.80 | 0.13 | 1.15 | 1.12 | 0.44 | 6.09 |
| Ellsworth, Kans. | Smoky Hill | 0.38 | 0.00 | 0.00 | 0.10 | T. | 0.20 | 0.40 | 0.30 | 1.00 | 0.00 | 0.25 | 1.63 | 0.00 | T. | 0.41 | 1.02 | 0.93 | 0.77 | 0.93 | 8.32 |
| Abilene, Kans. | do | 0.68 | 0.00 | 0.00 | 0.21 | T. | 0.02 | 0.18 | 0.09 | 0.52 | 0.00 | 0.16 | 0.40 | T. | 0.05 | 1.20 | 0.30 | 1.91 | 1.13 | 0.10 | 6.95 |
| Manhattan, Kans. | Kansas | 0.29 | 0.00 | 0.00 | 0.23 | T. | 0.10 | 0.52 | 0.07 | 0.80 | 0.00 | 0.20 | 0.73 | T. | 0.04 | 3.14 | 0.52 | 2.53 | 1.33 | 0.37 | 11.37 |
| Alton, Kans. | Solomon | T. | 0.00 | 0.00 | 0.10 | T. | T. | 0.15 | 0.15 | 0.75 | 0.00 | 0.70 | 1.95 | 0.03 | 0.20 | 0.75 | 0.05 | 1.41 | 0.91 | 0.57 | 7.72 |
| Topeka, Kans. | Kansas | 0.18 | 0.00 | 0.00 | 0.47 | 0.05 | 0.21 | 0.01 | 0.27 | 0.45 | T. | 0.23 | 0.50 | 1.40 | 0.32 | 3.06 | 0.36 | 2.04 | 2.16 | 0.37 | 12.08 |
| Kansas City, Mo. | Missouri | 0.13 | T. | 0.00 | 0.92 | 0.08 | 0.29 | T. | 0.17 | 0.63 | T. | 0.26 | 0.77 | 0.48 | 1.03 | 2.19 | 0.41 | 2.51 | 2.91 | 0.17 | 12.95 |
| Boonville, Mo. | do | 0.49 | 0.00 | 0.00 | 0.85 | 0.02 | 0.60 | 0.00 | 0.42 | 0.10 | T. | 0.20 | 0.62 | 0.40 | 3.83 | 2.86 | 0.84 | 3.67 | 0.40 | 0.25 | 15.55 |
| Osceola, Mo. | Osage | 1.21 | 0.00 | 0.00 | 1.21 | 0.68 | 1.08 | 0.00 | 1.02 | 0.10 | 0.00 | 0.75 | 0.40 | 0.49 | 3.43 | 3.45 | 1.19 | 4.83 | 1.28 | 0.00 | 20.52 |
| Warsaw, Mo. | do | 0.81 | 0.00 | 0.00 | 1.11 | 0.12 | 0.96 | 0.00 | 0.44 | 0.10 | 0.00 | 0.24 | 0.74 | 1.00 | 4.30 | 3.44 | 1.26 | 3.96 | 0.54 | T. | 19.02 |
| Hermann, Mo. | Missouri | 0.98 | 0.01 | 0.00 | 1.35 | 0.06 | 0.59 | 0.00 | 0.08 | 0.39 | 0.00 | 0.16 | 0.57 | 1.34 | 4.20 | 3.25 | 0.52 | 3.97 | 0.93 | 0.00 | 18.40 |

T. indicates trace.

TABLE 3.—*Precipitation by weeks, from December 18, 1926, to April 29, 1927*—Continued

ARKANSAS-WHITE RIVERS DRAINAGE BASIN

| Station | River | Dec. 18–24 | Dec. 25–31 | Jan. 1–7 | Jan. 8–14 | Jan. 15–21 | Jan. 22–28 | Jan. 29–Feb. 4 | Feb. 5–11 | Feb. 12–18 | Feb. 19–25 | Feb. 26–Mar. 4 | Mar. 5–11 | Mar. 12–18 | Mar. 19–25 | Mar. 26–Apr. 1 | Apr. 2–8 | Apr. 9–15 | Apr. 16–22 | Apr. 23–29 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Garfield, Colo. | Little Ark. | 0.35 | 0.00 | 0.00 | 0.14 | 0.11 | 0.22 | 0.32 | 0.19 | 2.74 | 0.92 | 1.58 | 1.07 | 0.66 | 0.90 | T. | 0.00 | 0.64 | 0.28 | T. | 10.12 |
| Pueblo, Colo. | Arkansas | 0.24 | 0.00 | 0.00 | 0.15 | 0.08 | 0.00 | 0.00 | 0.37 | 0.01 | 0.00 | 0.53 | 0.56 | 0.43 | 0.18 | 0.00 | T. | 0.01 | T. | 0.06 | 2.62 |
| Trinidad, Colo. | Purgatoire | 0.33 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.01 | 0.09 | 0.00 | 0.00 | 1.29 | 0.00 | 0.15 | 0.08 | 0.00 | 0.70 | 0.28 | 0.00 | 3.03 |
| Syracuse, Kans. | Arkansas | 0.25 | 0.00 | 0.00 | T. | 0.12 | T. | 0.00 | 0.00 | 0.00 | 0.00 | 0.34 | 0.35 | 0.05 | 0.20 | 0.20 | 0.05 | 0.75 | 1.15 | T. | 3.46 |
| Ashland, Kans. | Cimarron | 0.22 | 0.00 | 0.00 | 0.00 | T. | 0.16 | T. | 0.05 | 0.27 | 0.00 | 0.75 | 0.88 | 0.00 | T. | 0.69 | 0.14 | 0.62 | 0.93 | 0.07 | 4.78 |
| Emporia, Kans. | Neosho | 0.25 | 0.00 | 0.00 | 0.39 | T. | 0.27 | 0.20 | 0.00 | 0.25 | 0.00 | 0.18 | 1.52 | 0.00 | 0.90 | 2.36 | 1.03 | 1.94 | 2.90 | 0.55 | 12.74 |
| Springer, N. Mex. | Canadian | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T. | 0.00 | 0.00 | 0.13 | 0.21 | 0.00 | 0.04 | 0.00 | 0.00 | 0.44 | 0.10 | 0.00 | 1.19 |
| Dalhart, Tex. | do | 0.14 | 0.00 | 0.00 | T. | T. | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.23 | 0.20 | 0.00 | 0.00 | 0.09 | 0.00 | 0.88 | 0.02 | 0.00 | 1.66 |
| Oswego, Kans. | Neosho | 0.10 | 0.00 | 0.00 | 0.92 | 0.00 | 1.02 | 0.10 | 0.32 | 0.07 | 0.05 | 0.35 | 0.60 | 0.36 | 1.23 | 3.60 | 0.90 | 5.70 | 1.36 | 0.60 | 17.23 |
| Woodward, Okla. | North Canadian | 0.26 | 0.00 | 0.00 | 0.01 | 0.01 | 0.10 | 0.02 | 0.03 | 0.62 | 0.01 | 0.51 | 0.01 | 0.45 | 0.02 | 0.75 | 0.45 | 0.36 | 1.21 | 0.02 | 4.84 |
| Oklahoma City, Okla. | do | 1.33 | T. | 0.00 | 0.86 | T. | 0.75 | T. | 0.20 | 0.24 | 0.00 | 0.66 | 0.54 | 0.02 | 0.13 | 1.51 | 1.09 | 2.93 | 0.03 | 0.54 | 10.83 |
| Calvin, Okla. | Canadian | 1.75 | 0.02 | 0.00 | 0.96 | 0.49 | 0.47 | 0.16 | 0.70 | 0.00 | 0.00 | 1.05 | 0.10 | 1.94 | 0.80 | 0.43 | 1.70 | 2.35 | 2.10 | 0.46 | 15.48 |
| Dodge City, Kans. | Arkansas | 0.01 | 0.00 | 0.00 | T. | 0.01 | 0.01 | 0.01 | 0.10 | 0.63 | 0.03 | 0.44 | 1.16 | 0.29 | 0.04 | 0.24 | 2.62 | 0.77 | 0.67 | 0.31 | 7.34 |
| Wichita, Kans. | do | 0.33 | 0.00 | 0.00 | 0.30 | 0.02 | 0.23 | T. | 0.15 | 0.56 | 0.01 | 0.40 | 0.27 | 0.28 | 0.27 | 2.98 | 1.14 | 1.63 | 1.78 | 0.25 | 10.60 |
| Okay, Okla. | Verdigris | 1.22 | 0.00 | 0.00 | 2.00 | 0.50 | 1.67 | 0.95 | 0.41 | 0.23 | 0.00 | 1.09 | 0.03 | 1.28 | 0.68 | 0.90 | 0.70 | 6.33 | 2.28 | 0.04 | 20.31 |
| Fort Smith, Ark. | Arkansas | 1.84 | 0.15 | 0.00 | 0.79 | 0.45 | 3.36 | 0.14 | 0.41 | 0.53 | 0.03 | 1.04 | 0.16 | 1.73 | 0.29 | 0.75 | 0.25 | 6.02 | 3.33 | 0.07 | 21.34 |
| Ozark Beach, Mo. | White | 0.88 | 0.12 | 0.00 | 1.35 | 0.49 | 1.30 | 0.28 | 0.15 | 0.20 | 0.03 | 0.00 | 0.37 | 1.81 | 0.81 | 0.93 | 0.78 | 6.15 | 3.70 | 0.06 | 19.41 |
| Ozark, Ark. | Arkansas | 2.12 | 0.57 | 0.00 | 0.77 | 1.91 | 5.00 | 0.00 | 0.58 | 0.52 | 0.00 | 0.63 | 0.00 | 2.87 | 0.36 | 0.65 | 0.68 | 6.97 | 6.28 | 0.06 | 29.97 |
| Subiaco, Ark. | do | 2.50 | 1.04 | 0.00 | 0.70 | 1.70 | 4.09 | 0.08 | 0.96 | 0.25 | 0.11 | 1.51 | 0.66 | 4.67 | 1.15 | 0.57 | 0.65 | 9.79 | 6.55 | 0.01 | 36.99 |
| Lurton, Ark. | White | 2.52 | 0.84 | 0.00 | 1.27 | 2.41 | 4.79 | 0.27 | 0.51 | 0.89 | 0.00 | 0.60 | 1.39 | 2.35 | 0.51 | 2.26 | 0.71 | 10.26 | 6.17 | 0.11 | 37.86 |
| Danville, Ark. | Petit Jean | 2.75 | 1.10 | 0.00 | 0.50 | 1.90 | 5.22 | T. | 1.17 | 0.12 | T. | 1.15 | 0.47 | 2.26 | T. | 1.00 | 0.30 | 15.65 | 5.93 | T. | 39.52 |
| Morrillton, Ark. | Arkansas | 3.62 | 1.60 | 0.00 | 0.51 | 1.84 | 2.39 | 0.00 | 0.81 | 0.10 | 0.00 | 0.50 | 1.42 | 0.89 | 0.52 | 1.12 | 0.30 | 7.30 | 3.36 | 0.00 | 26.28 |
| Little Rock, Ark. | do | 6.63 | 1.82 | 0.00 | 0.43 | 1.43 | 2.56 | 0.17 | 1.33 | 0.58 | 0.09 | 1.13 | 3.69 | 0.68 | 1.10 | 1.23 | 0.64 | 5.26 | 8.90 | 0.00 | 37.67 |
| Pine Bluff, Ark. | do | 6.25 | 1.31 | 0.00 | 0.40 | 2.96 | 1.88 | 0.21 | 1.16 | 0.43 | 0.01 | 1.45 | 2.55 | 1.11 | 0.83 | 2.67 | 0.37 | 5.21 | 4.39 | 0.00 | 33.19 |
| Poplar Bluff, Mo. | Black | 2.24 | 1.28 | 0.00 | 0.59 | 2.51 | 6.68 | 0.86 | 0.41 | 0.49 | 0.06 | 0.36 | 0.41 | 3.85 | 1.01 | 1.99 | 2.96 | 7.82 | 1.32 | 0.06 | 34.90 |
| Corning, Ark. | White | 3.18 | 1.52 | 0.00 | 0.45 | 6.17 | 2.86 | 0.40 | 0.10 | 1.05 | 0.00 | 0.32 | 0.25 | 4.02 | 1.09 | 1.13 | 1.65 | 7.35 | 0.82 | 0.00 | 32.36 |
| Black Rock, Ark. | Black | 4.29 | 1.18 | 0.00 | 0.36 | 3.66 | 2.96 | 0.58 | 0.31 | 1.04 | 0.10 | 0.43 | 0.33 | 4.48 | 1.51 | 1.71 | 2.56 | 7.15 | 1.41 | T. | 34.06 |
| Gilbert, Ark. | White | 1.58 | 0.71 | 0.00 | 0.45 | 0.67 | 6.37 | 0.56 | 0.30 | 0.58 | 0.02 | 0.88 | 0.34 | 1.56 | 0.36 | 1.69 | 1.43 | 7.50 | 5.20 | 0.10 | 30.30 |
| Batesville, Ark. | do | 5.15 | 1.57 | 0.00 | 0.60 | 3.72 | 4.45 | 0.45 | 0.34 | 1.60 | 0.02 | 0.76 | 0.77 | 4.55 | 1.87 | 0.93 | 1.46 | 7.23 | 2.67 | 0.12 | 38.26 |
| Newport, Ark. | do | 3.45 | 0.47 | 0.00 | 0.43 | 2.56 | 2.07 | 0.37 | 0.39 | 1.12 | 0.08 | 0.41 | 0.89 | 2.98 | 1.57 | 0.90 | 0.68 | 6.92 | 2.36 | 0.05 | 28.68 |
| Arlberg, Ark. | do | 3.57 | 0.86 | 0.00 | 0.52 | 3.27 | 5.89 | 0.20 | 0.40 | 0.80 | 0.00 | 0.68 | 1.90 | 3.97 | 0.37 | 1.05 | 0.88 | 9.70 | 3.50 | 0.30 | 37.86 |
| Judsonia, Ark. | Little Red | 4.96 | 1.19 | 0.07 | 0.34 | 1.90 | 2.33 | T. | 0.89 | 0.62 | 0.36 | 0.77 | 2.01 | 0.64 | 1.66 | 1.01 | 0.48 | 9.63 | 2.59 | 0.27 | 31.72 |
| Patterson, Ark. | White | 6.31 | 2.02 | 0.00 | 0.12 | 1.75 | 2.87 | 0.72 | 1.68 | 0.70 | 0.06 | 0.16 | 2.28 | 2.30 | 0.84 | 1.39 | 0.38 | 7.78 | 3.55 | 0.08 | 34.99 |
| Clarendon, Ark. | White | 6.28 | 1.09 | 0.00 | 0.34 | 1.08 | 2.05 | 0.36 | 1.60 | 2.70 | 0.20 | 1.30 | 4.56 | 3.30 | 2.63 | 0.59 | 0.36 | 4.78 | 4.40 | 0.18 | 37.80 |

RED RIVER DRAINAGE BASIN

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denison, Tex. | Red | 3.34 | 0.87 | 0.00 | 1.00 | 1.00 | 2.45 | 0.00 | 1.17 | 0.00 | 0.00 | 2.80 | 1.40 | 0.30 | 0.15 | 0.00 | 0.72 | 3.95 | 4.25 | 0.70 | 24.10 |
| Arthur City, Tex. | do | 3.03 | T | 0.00 | 0.13 | 0.18 | 2.99 | 0.00 | 1.77 | 0.14 | 0.00 | 2.79 | 1.75 | 0.74 | 0.20 | 0.39 | 0.98 | 3.96 | 1.40 | 0.52 | 21.02 |
| Springbank, Ark. | do | 3.30 | 1.55 | 0.00 | 0.53 | 2.97 | 0.31 | 0.04 | 1.36 | 1.03 | 0.00 | 2.85 | 2.14 | 0.69 | 1.35 | 0.35 | 2.62 | 4.14 | 3.08 | 0.23 | 28.54 |
| Fulton, Ark. | do | 4.87 | 1.20 | 0.00 | 0.48 | 2.07 | 0.78 | 0.00 | 2.49 | 0.33 | 0.00 | 3.93 | 2.31 | 1.03 | 1.20 | 0.60 | 4.23 | 6.63 | 1.63 | 0.28 | 34.06 |
| Ringo Crossing, Tex. | Sulphur | 5.81 | 1.16 | 0.00 | 0.64 | 0.87 | 1.08 | 0.03 | 1.95 | 0.15 | 0.00 | 2.30 | 2.41 | 1.20 | 0.49 | 0.27 | 2.63 | 3.10 | 1.41 | 0.42 | 25.92 |
| Jefferson, Tex. | Cypress | 6.54 | 0.47 | 0.00 | 1.24 | 1.23 | 0.41 | 0.00 | 3.03 | 0.49 | 0.09 | 0.42 | 2.10 | 0.59 | 2.05 | 0.00 | 2.18 | 3.14 | 2.22 | 0.26 | 26.46 |
| Shreveport, La. | Red | 5.35 | 1.71 | 0.00 | 0.64 | 0.65 | 0.11 | 0.06 | 0.35 | 1.82 | 0.05 | 0.72 | 1.92 | 1.15 | 1.43 | 0.52 | 4.65 | 2.44 | 0.54 | 0.07 | 24.18 |
| Alexandria, La. | do | 1.06 | 5.91 | 0.00 | 0.95 | 1.17 | 0.25 | T. | T. | 5.65 | 0.50 | 0.45 | 1.95 | 4.63 | 2.25 | T. | 2.83 | 6.40 | 1.92 | 0.00 | 35.92 |
| Arkadelphia, Ark. | Ouachita | 5.56 | 1.47 | 0.00 | 0.45 | 2.39 | 2.56 | 0.08 | 1.08 | 0.40 | 0.00 | 2.56 | 2.90 | 0.48 | 0.70 | 1.10 | 0.23 | 5.93 | 5.45 | 0.11 | 33.45 |
| Camden, Ark. | do | 4.31 | 1.29 | 0.00 | 0.44 | 2.89 | 0.52 | 0.13 | 1.93 | 0.94 | 0.00 | 2.03 | 1.38 | 0.97 | 0.96 | 1.51 | 1.34 | 4.45 | 2.48 | 0.13 | 27.70 |
| Monroe, La. | do | 4.39 | 6.98 | 0.00 | 0.79 | 2.92 | 0.53 | 0.09 | 1.04 | 4.35 | T. | 1.62 | 4.52 | 4.11 | 1.71 | 0.74 | 2.07 | 2.60 | 6.27 | 0.00 | 44.73 |
| Melville, La. | Atchafalaya | 0.20 | 3.31 | 0.00 | 1.00 | 0.35 | 0.00 | 0.00 | 0.60 | 9.50 | 0.25 | 1.70 | 1.00 | 1.20 | 2.00 | 0.25 | 0.06 | 3.00 | 0.25 | 0.00 | 24.67 |

LOWER MISSISSIPPI RIVER DRAINAGE BASIN

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New Madrid, Mo. | Mississippi | 3.36 | 1.79 | 0.00 | 0.49 | 4.93 | 2.29 | 0.47 | 0.30 | 2.38 | 0.20 | 0.42 | 0.64 | 4.19 | 1.90 | 2.01 | 1.52 | 4.92 | 4.14 | T. | 35.96 |
| Memphis, Tenn. | do | 6.44 | 1.68 | 0.00 | 0.30 | 1.52 | 1.54 | 0.44 | 1.22 | 0.93 | 0.09 | 0.54 | 3.32 | 6.18 | 2.28 | 0.96 | 0.11 | 3.22 | 9.44 | 0.01 | 40.22 |
| Marked Tree, Ark. | St. Francis | 5.38 | 1.21 | 0.00 | 0.39 | 2.74 | 2.16 | 0.67 | 1.08 | 0.86 | 0.05 | 0.56 | 2.22 | 3.55 | 1.54 | 1.04 | 0.64 | 4.45 | 8.23 | T. | 36.77 |
| Helena, Ark. | Mississippi | 4.76 | 2.36 | 0.00 | 0.36 | 1.20 | 1.96 | 0.70 | 0.58 | 0.86 | 0.16 | 1.14 | 2.20 | 7.92 | 1.32 | 1.04 | 0.96 | 2.96 | 6.48 | 0.24 | 37.20 |
| Arkansas City, Ark. | do | 3.82 | 4.84 | 0.00 | 0.12 | 1.23 | 0.46 | 0.22 | 1.08 | 2.11 | 0.02 | 2.52 | 1.67 | 3.98 | 1.11 | 2.74 | 0.55 | 4.29 | 5.01 | 0.00 | 35.77 |
| Greenville, Miss. | do | 6.20 | 6.60 | 0.00 | 0.48 | 1.47 | 0.30 | 0.16 | 1.05 | 2.39 | 0.00 | 1.56 | 2.23 | 3.35 | 2.11 | 1.78 | 0.59 | 3.90 | 8.94 | 0.00 | 43.11 |
| Yazoo City, Miss. | Yazoo | 3.24 | 6.35 | 0.00 | 0.13 | 5.24 | 0.17 | 0.02 | 0.40 | 5.71 | 0.00 | 0.84 | 2.79 | 3.46 | 1.50 | 1.64 | 1.25 | 3.49 | 0.88 | 0.00 | 37.11 |
| Vicksburg, Miss. | Mississippi | 1.33 | 6.65 | 0.00 | 0.48 | 3.66 | 0.13 | 0.03 | 0.05 | 9.45 | 0.04 | 1.22 | 2.42 | 3.77 | 1.15 | 0.95 | 1.17 | 2.96 | 0.61 | 0.00 | 36.07 |
| Natchez, Miss. | do | 0.53 | 4.40 | 0.00 | 0.92 | 0.45 | 0.00 | T. | 0.10 | 5.46 | 1.46 | 0.59 | 1.72 | 2.20 | 1.93 | 0.00 | 0.87 | 3.54 | 0.79 | 0.00 | 24.96 |
| Baton Rouge, La. | do | 1.95 | 0.75 | 0.00 | 0.87 | 1.35 | 0.00 | 0.00 | 0.27 | 5.19 | 0.42 | 1.74 | 0.20 | 1.60 | 3.57 | 0.10 | 0.02 | 0.50 | 0.61 | 0.00 | 19.14 |
| Donaldsonville, La. | do | 0.67 | 1.14 | 0.00 | 1.07 | 0.22 | T. | 0.21 | 0.02 | 3.44 | 0.15 | 2.00 | 0.61 | 1.51 | 4.46 | T. | 0.00 | 0.24 | 4.01 | 0.00 | 19.75 |
| New Orleans, La. | do | 0.12 | 0.80 | 0.00 | 0.55 | 0.06 | T. | 0.01 | 0.44 | 6.64 | 1.01 | 4.17 | 0.26 | 1.29 | 4.32 | T. | 0.81 | T. | 14.13 | 0.00 | 34.61 |

T. indicates trace.

The resulting stages are given elsewhere in this report, see Table 2. The occurrence of crevasses in Arkansas, Mississippi, and Louisiana prevented still higher stages from the mouth of the Arkansas southward. The rise at New Orleans was brought to a conclusion on April 25 because of the dynamiting of the levee at Caernarvon, 14 miles below, and within the two weeks following the river fell 0.5 foot, after which there was a final crest of 20.7 feet on May 15. This latter crest began at Vicksburg on May 4, when the flow of water from the Mounds Landing, Miss., crevasse through the Yazoo Basin was at its peak, and was simply a delayed rise that would have been still greater had the levees above remained intact.

During the months of May, June, and July there was a very slow but general recession that was interrupted, however, by more heavy rains early in May over the Missouri and upper Mississippi Basins that again raised the Mississippi above the flood stage from Hannibal to Cairo and materially checked the fall below. There was a more decided rise in June with the Ohio as a further contributing factor, with the result that stages from 4 to 5 feet above the flood stage were experienced from Cairo, Ill., to Helena, Ark., and somewhat less from Vicksburg to Natchez, Miss. These latter rises, while not very great, were most unfortunate in that they reoverflowed much land from which the earlier flood had receded and on which crops had again been planted. The latest flood stage recorded was at Baton Rouge, La., where the river did not pass below the flood stage until July 14, while the last overflow water did not pass into the Gulf of Mexico until some time after August 1, 1927. This was over extreme southern Louisiana.

Table No. 4 shows the number of days the rivers were above flood stages during the flood of 1927.

TABLE 4.—*Number of days rivers were above flood stages during spring floods of 1927*

| Station | River | Flood stage | Duration and dates | | |
|---|---|---|---|---|---|
| | | | Number of days | Total days | Dates |
| Pittsburgh, Pa | Ohio | 25 | 3 | 3 | Jan. 22-24. |
| Zanesville, Ohio | Muskingum | 25 | 2 | 2 | Jan. 23-24. |
| Cincinnati, Ohio | Ohio | 52 | 7 | 7 | Jan. 24-30. |
| Frankfort, Ky | Kentucky | 31 | 3 | 3 | Jan. 22-24. |
| Louisville, Ky | Ohio | 28 | 9 | 9 | Jan. 24-Feb. 1. |
| Lock No. 2, Rumsey, Ky | Green | 34 | 22 | | Jan. 22-Feb. 12. |
| Do | do | | 25 | 47 | Mar. 13-Apr. 6. |
| Evansville, Ky | Ohio | 35 | 18 | | Jan. 23-Feb. 9. |
| Do | do | | 8 | | Feb. 26-Mar. 5. |
| Do | do | | 18 | 44 | Mar. 20-Apr. 6. |
| Mount Carmel, Ill | Wabash | 16 | 27 | | Jan. 23-Feb. 18. |
| Do | do | | 41 | | Mar. 19-Apr. 28. |
| Do | do | | 22 | 90 | May 22-June 12. |
| Clarksville, Tenn | Cumberland | 46 | 19 | | Dec. 22, 1926-Jan. 9, 1927. |
| Do | do | | 5 | 24 | Mar. 13-17. |
| Johnsonville, Tenn | Tennessee | 31 | 17 | | Dec. 26, 1926-Jan. 11, 1927. |
| Do | do | | 8 | | Mar. 14-21. |
| Do | do | | 4 | 29 | Apr. 15-18. |
| Paducah, Ky | Ohio | 43 | 11 | | Jan. 1-11. |
| Do | do | | 6 | | Feb. 3-8. |
| Do | do | | 8 | | Mar. 20-27. |
| Do | do | | 12 | 37 | Apr. 13-24. |
| Cairo, Ill | do | 45 | 12 | | Jan. 1-12. |
| Do | do | | 13 | | Feb. 1-13. |
| Do | do | | 50 | | Mar. 17-May 5. |
| Do | do | | 13 | 88 | June 2-14. |
| Keokuk, Iowa | Mississippi | 14 | 5 | 5 | Apr. 20-24. |

TABLE 4.—*Number of days rivers were above flood stages during spring floods of 1927*—Continued

| Station | River | Flood stage | Duration and dates | | |
|---|---|---|---|---|---|
| | | | Number of days | Total days | Dates |
| Hannibal, Mo | Mississippi | 13 | 29 | | Mar. 31-Apr. 28. |
| Do | do | | 2 | | May 20-21. |
| Do | do | | 16 | 47 | May 25-June 9. |
| Beardstown, Ill | Illinois | 14 | 31 | | Dec. 1-31, 1926. |
| Do | do | | 155 | 186 | Feb. 4-July 8. |
| Grafton, Ill | Mississippi | 18 | 4 | | Mar. 21-24. |
| Do | do | | 33 | | Apr. 2-May 4. |
| Do | do | | 4 | | May 10-13. |
| Do | do | | 25 | 66 | May 25-June 18. |
| Omaha, Nebr | Missouri | 19 | 3 | 3 | May 14-16. |
| Kansas City, Mo | do | 22 | 4 | 4 | Apr. 19-22. |
| Chillicothe, Mo | Grand | 18 | 4 | | Apr. 2-5. |
| Do | do | | 15 | | Apr. 10-24. |
| Do | do | | 3 | 22 | June 4-6. |
| Tuscumbia, Mo | Osage | 25 | 8 | | Mar. 20-27. |
| Do | do | | 8 | | Apr. 1-8. |
| Do | do | | 19 | | Apr. 11-29. |
| Do | do | | 2 | 37 | June 24-25. |
| Hermann, Mo | Missouri | 21 | 17 | | Apr. 12-28. |
| Do | do | | 1 | | May 10. |
| Do | do | | 3 | 21 | June 5-7. |
| St. Louis, Mo | Mississippi | 30 | 4 | | Apr. 4-7. |
| Do | do | | 19 | | Apr. 13-May 1. |
| Do | do | | 1 | | May 11. |
| Do | do | | 8 | 32 | June 4-11. |
| Cape Girardeau, Mo | do | 30 | 7 | | Mar. 22-28. |
| Do | do | | 35 | | Apr. 2-May 6. |
| Do | do | | 6 | | May 10-15. |
| Do | do | | 26 | 74 | May 26-June 20. |
| New Madrid, Mo | do | 34 | 13 | | Jan. 1-13. |
| Do | do | | 16 | | Feb. 1-16. |
| Do | do | | 61 | | Mar. 17-May 16. |
| Do | do | | 18 | 108 | June 1-18. |
| Memphis, Tenn | do | 35 | 12 | | Jan. 5-16. |
| Do | do | | 16 | | Feb. 5-20. |
| Do | do | | 62 | | Mar. 19-May 19. |
| Do | do | | 17 | 107 | June 6-22. |
| Marked Tree, Ark | St. Francis | 17 | 20 | | Feb. 1-20. |
| Do | do | | 71 | 91 | Apr. 9-June 18. |
| Helena, Ark | Mississippi | 44 | 10 | | Jan. 9-18. |
| Do | do | | 18 | | Feb. 7-24. |
| Do | do | | 65 | | Mar. 20-May 23 |
| Do | do | | 18 | 111 | June 8-25. |
| Oswego, Kans | Neosho | 17 | 3 | | Mar. 20-22. |
| Do | do | | 4 | | Apr. 2-5. |
| Do | do | | 19 | | Apr. 9-27. |
| Do | do | | 3 | 29 | May 8-10. |
| Fort Smith, Ark | Arkansas | 22 | 17 | 17 | Apr. 12-28. |
| Little Rock, Ark | do | 23 | 16 | 16 | Apr. 15-30. |
| Pine Bluff, Ark | do | 25 | 19 | 19 | Apr. 15-May 3. |
| Black Rock, Ark | Black | 14 | 25 | | Jan. 21-Feb. 14. |
| Do | do | | 104 | 129 | Mar. 18-June 29. |
| Clarendon, Ark | White | 30 | 14 | | Jan. 31-Feb. 13. |
| Do | do | | 27 | 41 | Apr. 16-May 12. |
| Arkansas City, Ark | Mississippi | 48 | 7 | | Jan. 14-20. |
| Do | do | | 24 | | Feb. 6-Mar. 1. |
| Do | do | | 50 | 81 | Mar. 22-May 10. |
| Greeneville, Miss | do | 42 | 21 | | Feb. 8-28. |
| Do | do | | 48 | 69 | Mar. 24-May 10. |
| Greenwood, Miss | Yazoo | 36 | 11 | 11 | Dec. 31, 1926-Jan. 10, 1927. |
| Yazoo City, Miss | do | 25 | 185 | 185 | Jan. 9-July 12. |
| Vicksburg, Miss | Mississippi | 45 | 10 | | Jan. 16-25. |
| Do | do | | 156 | 166 | Feb. 6-July 11. |
| Natchez, Miss | do | 46 | 149 | 149 | Feb. 12-July 10. |
| Alexandria, La | Red | 36 | 29 | 29 | Apr. 20-May 18. |
| Camden, Ark | Ouachita | 30 | 10 | | Dec. 24, 1926-Jan. 2, 1927. |
| Do | do | | 9 | | Jan. 25-Feb. 2. |
| Do | do | | 8 | | Mar. 10-17. |
| Do | do | | 15 | 42 | Apr. 16-30. |
| Monroe, La | do | 40 | 90 | 90 | Mar. 20-June 17. |
| Baton Rouge, La | Mississippi | 35 | 153 | 153 | Feb. 12-July 14. |
| Donaldsonville, La | do | 28 | 147 | 147 | Feb. 12-July 8. |
| New Orleans, La | do | 17 | 120 | 120 | Feb. 13-June 12. |
| Melville, La | Atchafalaya | 37 | 120 | 120 | Feb. 14-June 13. |
| Morgan City, La | do | 8 | 31 | 31 | May 26-June 25. |

### ANALYSIS OF RAINFALL

In order to present the rainfall data for the 1927 floods with greater precision than is possible by the usual system of averages, recourse was had to a scheme previously described (**1**, loc. cit. pp. 8, 9). For convenience the description is reproduced below.

The rainfall for each drainage basin was computed according to a method suggested by Marvin, and is as follows: Monthly data for a large number of stations were charted and isohyetal lines carefully drawn. These lines were then traced upon sheets of cross-section paper, together with the outlines of the six drainage areas.

The isohyets divide the drainage basins into various irregular small subareas, over which the precipitation may be assumed to be uniform and of an amount represented by the mean between the two adjacent isohyetals. Therefore the number of squares in each subarea was counted. This number was then multiplied by the average precipitation for the subarea in question and the product divided by the sum of the counts for all the subareas, which latter, of course, is the number of squares in the whole drainage basin being studied. Finally, the sum of the quotients found in the above manner gives the depth of precipitation, which, spread uniformly over the whole basin, would represent the same amount of water as fell in the irregularly distributed precipitation. This procedure, while laborious, was well worth the time consumed, and it is thought to have accomplished a more accurate presentation of data than was possible otherwise.

The amount of squares in the subarea was limited always by the boundary lines of the watershed, except in the extreme upper Arkansas, Missouri, and Mississippi Valleys. In these territories the winter and spring precipitation is invariably small, mostly in the form of light snow, contributing practically nothing to flood conditions. The drainage basins were therefore cut off for these regions by an arbitrary straight line running from the headwaters of the Canadian northeastward through Omaha and a point about 150 miles east of St. Paul.

IN MONTHLY WEATHER REVIEW SUPPLEMENT NO. 22 (loc. cit.) the entire drainage area of 1,250,900 square miles was not used, the extreme upper Arkansas, the upper Missouri, and the extreme upper Mississippi Valleys having been eliminated for the reason that their precipitation in winter and spring, being small and mostly in the form of snow, usually contributed little or nothing to flood conditions. About 30 per cent of the total area was thus eliminated, but owing to the substantial amounts of precipitation over these upper areas in 1927 it became necessary to compute the depth of water over the entire area, and equally necessary for purposes of proper comparison to recompute on the same basis the data for 1882, 1903, 1912, 1913, and 1922. The results of the computations are as given in Table 5, and with them are also the departures from the normal values.

TABLE 5.—*Precipitation for six floods in terms of inches of water over entire drainage area, and normal departures for same*

[Departures plus when without sign]

| Subarea | Drainage (square miles) | 1882 | | | | | | | | 1903 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | January | | February | | March | | Total | | January | | February | | March | | Total | |
| | | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure |
| Upper Mississippi | 187,850 | 0.17 | −0.04 | 0.49 | 0.29 | 0.44 | 0.14 | 1.10 | 0.39 | 0.10 | −0.11 | 0.24 | 0.04 | 0.33 | 0.03 | 0.67 | −0.04 |
| Missouri | 528,850 | 0.20 | −0.10 | 0.55 | 0.22 | 0.44 | −0.06 | 1.19 | 0.06 | 0.23 | −0.07 | 0.53 | 0.20 | 0.47 | −0.02 | 1.23 | 0.11 |
| Ohio | 203,900 | 0.94 | 0.29 | 0.92 | 0.39 | 0.73 | 0.02 | 2.59 | 0.70 | 0.33 | −0.32 | 0.86 | 0.33 | 0.59 | −0.12 | 1.78 | −0.11 |
| Arkansas-White | 186,000 | 0.24 | 0.03 | 0.47 | 0.25 | 0.31 | −0.01 | 1.02 | 0.27 | 0.11 | −0.10 | 0.50 | 0.28 | 0.27 | −0.05 | 0.88 | 0.13 |
| Red | 90,000 | 0.35 | 0.17 | 0.29 | 0.12 | 0.20 | −0.03 | 0.84 | 0.26 | 0.13 | −0.05 | 0.41 | 0.24 | 0.26 | 0.03 | 0.80 | 0.22 |
| Lower Mississippi | 54,300 | 0.37 | 0.16 | 0.31 | 0.12 | 0.26 | 0.04 | 0.94 | 0.32 | 0.17 | −0.04 | 0.33 | 0.14 | 0.25 | 0.03 | 0.75 | 0.13 |
| Total | 1,250,900 | 2.27 | 0.51 | 3.03 | 1.39 | 2.38 | 0.10 | 7.68 | 2.00 | 1.07 | −0.69 | 2.87 | 1.23 | 2.17 | −0.10 | 6.11 | 0.44 |

| Subarea | Drainage (square miles) | 1912 | | | | | | | | 1913 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | February | | March | | April | | Total | | January | | February | | March | | Total | |
| | | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure |
| Upper Mississippi | 187,850 | 0.16 | −0.04 | 0.30 | 0.00 | 0.50 | 0.08 | 0.96 | 0.04 | 0.24 | 0.03 | 0.20 | 0.00 | 0.48 | 0.18 | 0.92 | 0.21 |
| Missouri | 528,850 | 0.45 | 0.12 | 0.87 | 0.38 | 1.12 | 0.27 | 2.44 | 0.77 | 0.35 | 0.05 | 0.44 | 0.11 | 0.68 | 0.19 | 1.47 | 0.35 |
| Ohio | 205,900 | 0.37 | −0.16 | 0.83 | 0.13 | 0.83 | 0.21 | 2.03 | 0.18 | 0.98 | 0.33 | 0.37 | −0.16 | 0.58 | −0.13 | 1.93 | 0.04 |
| Arkansas-White | 186,000 | 0.31 | 0.09 | 0.43 | 0.11 | 0.50 | 0.05 | 1.24 | 0.25 | 0.31 | 0.10 | 0.24 | 0.02 | 0.23 | −0.09 | 0.78 | 0.03 |
| Red | 90,000 | 0.13 | −0.04 | 0.35 | 0.12 | 0.29 | −0.02 | 0.77 | 0.06 | 0.22 | 0.04 | 0.20 | 0.03 | 0.15 | −0.08 | 0.57 | −0.01 |
| Lower Mississippi | 54,300 | 0.12 | −0.07 | 0.34 | 0.12 | 0.34 | 0.12 | 0.80 | 0.17 | 0.34 | 0.13 | 0.21 | 0.02 | 0.22 | 0.00 | 0.77 | 0.15 |
| Total | 1,250,900 | 1.54 | −0.10 | 3.12 | 0.86 | 3.58 | 0.71 | 8.24 | 1.47 | 2.44 | 0.68 | 1.66 | 0.02 | 2.34 | 0.07 | 6.44 | 0.77 |

| Subarea | Drainage (square miles) | 1922 | | | | | | | | | | 1927 | | | | | | | | | | Dec. 18–31, 1926 | | 1927 total, including Dec. 18–31, 1926 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | January | | February | | March | | April | | Total | | January | | February | | March | | April | | Total | | | | | |
| | | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure | Amount | Departure |
| Upper Mississippi | 187,850 | 0.16 | −0.05 | 0.31 | −0.11 | 0.35 | 0.05 | 0.53 | 0.11 | 1.35 | 0.22 | 0.15 | −0.06 | 0.15 | −0.05 | 0.40 | 0.10 | 0.64 | 0.22 | 1.34 | 0.21 | 0.08 | −0.01 | 1.42 | 0.20 |
| Missouri | 528,850 | 0.29 | −0.01 | 0.44 | 0.11 | 0.89 | 0.39 | 1.48 | 0.63 | 3.10 | 1.12 | 0.25 | −0.05 | 0.28 | −0.05 | 0.63 | 0.14 | 1.59 | 0.74 | 2.75 | 0.78 | 0.07 | −0.07 | 2.82 | 0.71 |
| Ohio | 203,900 | 0.44 | −0.21 | 0.41 | −0.12 | 0.92 | 0.21 | 0.66 | 0.04 | 2.43 | −0.08 | 0.67 | 0.02 | 0.54 | 0.01 | 0.82 | 0.11 | 0.95 | 0.33 | 2.98 | 0.47 | 0.70 | 0.43 | 3.68 | 0.90 |
| Arkansas-White | 186,000 | 0.18 | −0.03 | 0.21 | −0.[illegible] | 0.60 | 0.28 | 0.62 | 0.17 | 1.61 | 0.41 | 0.30 | 0.09 | 0.16 | −0.06 | 0.48 | 0.16 | 0.69 | 0.24 | 1.63 | 0.43 | 0.22 | −0.11 | 1.85 | 0.32 |
| Red | 90,000 | 0.19 | 0.01 | 0.22 | 0.05 | 0.40 | 0.17 | 0.36 | 0.05 | 1.17 | 0.28 | 0.17 | −0.01 | 0.17 | 0.00 | 0.29 | 0.06 | 0.42 | 0.11 | 1.05 | 0.16 | 0.25 | −0.15 | 1.30 | 0.01 |
| Lower Mississippi | 54,300 | 0.19 | −0.02 | 0.21 | 0.02 | 0.36 | 0.14 | 0.16 | −0.06 | 0.92 | 0.08 | 0.16 | −0.05 | 0.18 | −0.01 | 0.37 | 0.15 | 0.33 | 0.11 | 1.04 | 0.20 | 0.27 | −0.17 | 1.31 | 0.03 |
| Total | 1,250,900 | 1.45 | −0.31 | 1.80 | 0.16 | 3.52 | 1.24 | 3.81 | 0.94 | 10.58 | 2.03 | 1.70 | −0.06 | 1.48 | −0.16 | 2.99 | 0.72 | 4.62 | 1.75 | 10.79 | 2.25 | 1.59 | −0.08 | 12.38 | 2.17 |

The following remarks are submitted with reference to the method of deriving the data entered in Table 5.

The entries in columns headed "Amount" are the amounts of precipitation computed as indicated in the description just quoted; the depth of the precipitation for each subarea is, however, expressed as the depth in inches and hundredths if spread over the entire drainage area, viz, 1,250,900 square miles.

The entries in the columns headed "Departure" were obtained from a set of weighted (for area only) normal precipitation tables for the several subareas, furnished through the courtesy of Mr. Montrose W. Hayes, in charge of the Weather Bureau office at St. Louis, Mo., working in conjunction with the Mississippi River Commission.

Attention is invited to the fact that the months January to March usually embraced the important flood rains; in the case of the 1922 and 1927 floods, however, it was necessary to include the month April, thus increasing the rain period to four months instead of three, as in the remaining floods. As a result, the total quantity of water available in the two last-named is greater than in the others, but since the object in presenting the data in this form is to facilitate the allocation of the flood producing rains to the several subareas that contributed it, this purpose is not affected by the use of a four rather than a three month rain period.

The time of occurrence and the spatial distribution of the precipitation govern the magnitude of the spring floods of the central and lower Mississippi River and its tributaries. Hitherto it has been considered an indisputable fact, and the previous records certainly sustain this conviction, that there can be no great flood in the Mississippi River below Cairo unless it should be preceded by a great and general Ohio River flood. But the flood of 1927 has apparently shattered this conviction so far as the section from the mouth of the Arkansas River southward is concerned. In the absence of definite figures the estimated discharge of the Arkansas and White Rivers, had the levees remained intact, certainly lend tentative support to this conclusion, and the primary reason therefor goes back to the almost saturated soil that had not been afforded an opportunity to dispose of the excess water received from the rains of the autumn of 1926.

The inclusion of the entire drainage area in Table 5 did not cause any material change in the relative order of flood magnitude as given in Table 10, MONTHLY WEATHER REVIEW SUPPLEMENT No. 22 (loc. cit.). The flood of 1912 apparently displaced that of 1882 by a margin of 0.56 inch of water over the entire basin. Otherwise the order would be the same, but of course with the flood of 1927 at the head. There can be no proper comparison between the floods of 1882 and 1912 from Cairo southward, as in 1882 the general levee system was virtually in its infancy, while in 1912 it was approaching completion. However, the excess precipitation over the upper Mississippi and Missouri Basins easily decides the question of magnitude. In both floods the Ohio Basin was, as usual, the decisive factor, but in 1882, when the flood was an early one, the precipitation was not unusual above Cairo, while in 1912 it was considerably over the normal amount from the extreme lower Missouri Basin eastward over the adjacent Mississippi Basin. Below Cairo conditions were much the same during both years, although of course the 1912 stages were higher.

When we come to compare the floods of 1922 and 1927, Table 5 does not disclose any significant differences, the totals being 10.58 inches for 1922 and 10.79 inches for 1927, excluding from the latter 1.59 inches that fell during the last two weeks of December, 1926. This 1.59 inches, of which nearly one-half came from the Ohio drainage, accounts for much of the superiority of the flood of 1927, although the torrential rains of April over the lower Arkansas Valley played an equally important part.

It therefore appears that, measured by the comparative depths of water precipitated over the entire drainage basin of the Mississippi River, the relative order of magnitude of six of the great floods of the last 45 years will be as follows: 1927, 1922, 1912, 1882, 1913, and 1903. But it must be remembered that precipitation figures are not the only important governing factors in flood causation. The spatial distribution of the precipitation and its amount in point of time are at least of equal importance.

*Run-off.*—In SUPPLEMENT No. 22 (loc. cit.) (The Spring Floods of 1922), pages 7 and 8, there were exhibited the rainfall (uniform cover) and the total discharge over the abridged drainage area described on pages 8 and 9. The discharge figures were based upon the average ratio of discharge to precipitation as assumed by Humphreys and Abbott and by Greenleaf and were as follows:

| Basin: | *Ratio of discharge to precipitation* | Ratio |
|---|---|---|
| Ohio | | 0.30 |
| Upper Mississippi | | .28 |
| Missouri | | .15 |
| Arkansas | | .16 |
| Red | | .22 |
| Lower Mississippi | | .52 |
| Entire basin | | .25 |

In Bulletin E, Floods of the Mississippi River, Weather Bureau, 1897, Morrill computed the normal annual discharge of the entire Mississippi Basin to be 785,190,000,000 cubic yards, using as a basis certain deductions made by Humphreys and Abbott.[1] In 1926 and 1927, Messrs. M. W. Hayes and W. J. Moxom, of the St. Louis Weather Bureau Office, computed the normal annual precipitation of the basin in terms of the weighted monthly means of the individual subbasins multiplied by the ratios between the subbasin areas and the area of the entire basin. They found the normal annual precipitation to be 30.11 inches. Using 0.25 as the ratio of discharge to precipitation we obtain as the present total annual discharge 810,174,940,640 cubic yards, which differs from the figures obtained by Morrill by only 3 per cent, a remarkable agreement when we take into consideration the limited data available during the last century.

No discharge figures for 1927 are available, and therefore the above procedure was followed except that on account of the important part played in 1927 by the Missouri and upper Mississippi Valleys the entire drainage area was used, and the discharge data for the floods of 1882, 1903, 1912, 1913, and 1922 recomputed on that basis. While the results, of course, are only the product of average conditions, they may nevertheless afford some comparative idea of the amount of water that actually entered the streams at some point or other. Attention is invited to the fact that much of the winter precipitation over that portion of the drainage basin of the Mississippi River above the mouth of the Missouri and that of the Missouri River above the mouth of the Platte is in the form of snow of which very little is contributed to the actual run-off. Therefore, the winter figures for the districts mentioned are probably in excess to a fair amount. Data for the six floods are given in Table 6 following:

[1] Section on Hydrology in Report on the Water Power of the Mississippi River, Tenth Census.

TABLE 6.—*Approximate discharge, for six floods, in millions of cubic yards*

| Subarea | 1882 | | | | 1903 | | | | 1912 | | | | 1913 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | Total | January | February | March | Total | February | March | April | Total | January | February | March | Total |
| Upper Mississippi | 5,123 | 14,767 | 13,260 | 33,150 | 3,014 | 7,232 | 9,945 | 20,191 | 4,822 | 9,041 | 15,068 | 28,931 | 7,233 | 6,027 | 14,465 | 27,725 |
| Missouri | 3,229 | 8,879 | 7,104 | 19,212 | 3,713 | 8,556 | 7,588 | 19,857 | 7,265 | 14,046 | 18,082 | 39,393 | 5,651 | 7,103 | 10,978 | 23,732 |
| Ohio | 30,351 | 29,706 | 23,570 | 83,627 | 10,655 | 27,768 | 19,051 | 57,474 | 11,947 | 26,800 | 26,800 | 65,547 | 31,643 | 11,947 | 18,727 | 62,317 |
| Arkansas-White | 4,133 | 8,094 | 5,338 | 17,565 | 1,894 | 8,610 | 4,650 | 15,154 | 5,338 | 7,405 | 8,610 | 21,353 | 5,338 | 4,133 | 3,961 | 13,432 |
| Red | 8,287 | 6,867 | 4,736 | 19,890 | 3,078 | 9,708 | 6,156 | 18,942 | 3,078 | 8,287 | 6,867 | 18,232 | 5,209 | 4,736 | 3,552 | 13,497 |
| Lower Mississippi | 20,708 | 17,350 | 14,551 | 52,609 | 9,514 | 18,469 | 13,992 | 41,975 | 6,717 | 19,029 | 19,029 | 44,775 | 19,029 | 11,753 | 12,312 | 43,094 |
| Total | 71,831 | 85,663 | 68,559 | 226,053 | 31,868 | 80,343 | 61,382 | 173,593 | 39,167 | 84,608 | 94,456 | 218,231 | 74,103 | 45,699 | 63,995 | 183,797 |

| Subarea | 1922 | | | | | 1927 | | | | | Dec. 18–31, 1926 | Total, including Dec. 18–31, 1926 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | April | Total | January | February | March | April | Total | | |
| Upper Mississippi | 4,822 | 9,342 | 10,548 | 15,972 | 40,684 | 4,520 | 4,520 | 12,055 | 19,287 | 40,382 | 2,411 | 42,793 |
| Missouri | 4,682 | 7,103 | 14,368 | 23,894 | 50,047 | 4,036 | 4,520 | 10,171 | 25,669 | 44,396 | 1,130 | 45,526 |
| Ohio | 14,207 | 13,238 | 29,706 | 21,310 | 78,461 | 21,633 | 17,436 | 26,477 | 30,674 | 96,220 | 22,602 | 118,822 |
| Arkansas-White | 3,100 | 3,616 | 10,332 | 10,677 | 27,725 | 5,166 | 2,755 | 8,266 | 11,882 | 28,069 | 3,788 | 31,857 |
| Red | 4,499 | 5,209 | 9,471 | 8,524 | 27,703 | 4,025 | 4,025 | 6,867 | 9,945 | 24,862 | 5,919 | 30,781 |
| Lower Mississippi | 10,634 | 11,753 | 20,148 | 8,955 | 51,490 | 8,955 | 10,074 | 20,708 | 18,469 | 58,206 | 15,111 | 73,317 |
| Total | 41,944 | 50,261 | 94,573 | 89,332 | 276,110 | 48,335 | 43,330 | 84,544 | 115,926 | 292,135 | 50,961 | 343,096 |

The figures in the above table although of course only close approximations show clearly the supremacy of the floods of 1927 and 1922 above all others, as well as the outstanding supremacy of the flood of 1927. Moreover the great excess discharge in April, 1927, affords a sufficient explanation of the increased magnitude of the flood of 1927. It is noted also that the greater portion of the excess of 1927 came from the Ohio and lower Mississippi drainage, especially the Ohio. It also appears further that the total discharge for January and February for the two floods, 1922 and 1927, did not differ materially, March and April, 1927, virtually supplying the entire excess over 1922.

The total volume of water supplied by the rain in 1927 was 244.4 cubic miles for the period from December 18,1926, to April 30, 1927, and 213 cubic miles for the period from January 1 to April 30, 1927. The total discharge for 1927 computed on a basis of 27 per cent of the water over the area was 66 cubic miles for the long period, and on a basis of 26 per cent, 55.4 cubic miles for the short period. The total movement of water of the Gulf Stream through the Straits of Florida in one day of 24 hours is 240.7 cubic miles,[1] or 3.7 cubic miles less than that that fell in the form of rain over the drainage basin of the Mississippi River from December 18, 1926, to April 30, 1927.

*Probability of greater floods.*—What would have been the actual crest stages in 1927 from Paducah to New Orleans had all levees remained intact and the amount and distribution of precipitation been the same? This question does not appear to be difficult to answer within reasonable limits of correctness for the section between Cairo and Helena, but below Helena there must be a certain measure of speculation owing to the difficulty of accurate determination as to the volume of water diverted through the crevasses from the main channels. This is particularly true for Arkansas City, Ark., for it is believed that the discharge data computed by the United States Engineer Corps will show the greatest run-off ever recorded in the lower Arkansas and lower White Rivers. The flood crest in the lower Arkansas as measured by the gage heights at Little Rock was only 1.6 feet lower than that of June, 1833, at which time there could not have been any levees of consequence, leaving the fair inference that the discharge at Arkansas City would have been greater in 1927 had the levees held. The situation at Arkansas City was further complicated by the great crevasse at Mounds Landing, Miss., almost directly opposite Arkansas City. This crevasse occurred almost simultaneously with the maximum stage of 60.5 feet at Arkansas City on the morning of April 21.

Table 7, below gives for Paducah, Ky., and Cairo, Ill., on the Ohio River and various places on the Mississippi River from St. Louis to New Orleans the estimated stages that would have been reached in 1927, had all levees remained intact, and without intervening heavy rains other than those that occurred after the crest had passed Cairo. The table also gives the estimated greatest possible stages that could occur in the future under the most favorable conditions of flood causation. Before this table was prepared the opinions of the officials in charge of some of the Weather Bureau stations within the district were invited, and due regard was had to these. It is admitted that the established progress of meteorological conditions across the country makes the occurrence of such a superflood very remote, yet it is not absolutely beyond the limits of possibility.

TABLE 7.—*Possible crest stages during flood of 1927 with all levees intact; also estimated stages of maximum flood that could occur*

| Station | Possible 1927 stages | Maximum possible stages | Station | Possible 1927 stages | Maximum possible stages |
|---|---|---|---|---|---|
| Paducah, Ky. | 48.0 | 65.0–65.5 | Arkansas City, Ark. | 68.5–69.0 | 72.5–73.0 |
| Cairo, Ill. | 57.7–58.0 | 65.5–66.0 | Greenville, Miss. | 61.5–62.0 | 65.5–66.0 |
| St. Louis, Mo. | 36.1 | 45.4–46.4 | Lake Providence, La. | 59.0–59.5 | 63.0–63.5 |
| Cape Girardeau, Mo. | 41.5 | 51.4–52.4 | Vicksburg, Miss. | 64.5–65.0 | 68.5–69.0 |
| New Madrid, Mo. | 45.0–45.3 | 51.0–51.5 | Natchez, Miss. | 64.5–65.0 | 68.5–69.0 |
| Cottonwood Point, Mo. | 43.0–43.3 | 46.5–47.0 | Baton Rouge, La. | 54.5–55.0 | 58.5–59.0 |
| Memphis, Tenn. | 47.2–47.5 | 54.5–55.0 | Donaldsonville, La. | 44.5–45.0 | 48.5–49.0 |
| Helena, Ark. | 58.2–58.5 | 66.0–66.5 | New Orleans, La. | 27.2–27.7 | 29.5–30.0 |

As the problem is one that is of much importance in connection with the subject of future flood control, we will now discuss at some length the reasoning that led to the evolution of the figures given in Table 10.

[1] Findlay, Alex. Geo., Ocean Meteorology, 1887. Page 67.

STAGES FOR 1927

*Cairo, Ill.*—The actual crest stage was 56.4 on April 20. The crevasse at Dorena, Mo., 30 miles below Cairo, occurred at 4 a. m. April 16, and after that time the river at Cairo rose only 0.7 foot, notwithstanding the fact that the Mississippi at St. Louis was rising steadily and continued to do so for nearly a week after. The Ohio at Paducah also continued to rise for a few days after the crevasse. The rises at St. Louis and Paducah after the Dorena crevasse were about 2 and 0.9 foot, respectively, with an increase of only 0.7 foot on the Cairo gage. It is apparent then, if the Dorena crevasse had not occurred, the crest stage at Cairo would have been 57.7 to 58 feet about but not after the end of April. With a flood in the upper Ohio equal to that of 1913 the crest at Cairo would probably have been approximately 62 feet.

*Paducah, Ky.*—As the stages at Paducah under existing conditions were partly due to backwater from the mouth of the river, some of the additional rise allowed for Cairo would be reflected on the Paducah gage, and, allowing for a difference of about 9.5 feet between Paducah and Cairo with a one-day interval, the highest stage at Paducah would have been very close to 48 feet. The actual crest was 47.2 feet on April 18.

*St. Louis, Mo.*—There is nothing to indicate that there would have been any change in the crest at St. Louis, except possibly two or three-tenths of a foot. The actual crest was 36.1 feet on April 26, six days after the crest occurred at Cairo.

*Cape Girardeau, Mo.*—Damming effect from Cairo is also pronounced at Cape Girardeau, and this combined with the additional rise of 2 feet coming from St. Louis would have added about 1.5 feet to the recorded crest of 40 feet on April 20, making a probable crest of 41.5 feet.

*New Madrid, Mo., Cottonwood Point, Mo., and Memphis, Tenn.*—For these places the problem becomes the much simpler one of applying the normal differences between them and the estimated crest for Cairo. Doing this we would have—

| Cairo | New Madrid | | Cottonwood Point | | Memphis | |
|---|---|---|---|---|---|---|
| | Difference | Crest | Difference | Crest | Difference | Crest |
| | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* |
| 57.7–58 feet | −12.7 | 45–45.3 | −14.7 | 43–43.3 | −10.5 | 47.2–47.5 |

*Helena, Ark.*—Here the problem is complicated through the influence of the stages at Arkansas City, Ark., upon those at Helena. In 1927 the stage at Arkansas City would have been so high that it would have exercised a slight damming effect and increased the stage at Helena accordingly. Making due allowance of about 0.5 foot for this, the Helena crest, based upon Cairo, would have been from 58.2 to 58.5 feet.

*Arkansas City, Ark.*—The situation here was a very complex one on account of the enormous volume of water from the Arkansas and White Rivers and the great crevasses along those rivers and at Mounds Landing, Miss., almost directly opposite Arkansas City. With Cairo at 56.4 feet on April 20, the crest stage at Arkansas City without crevasses and without abnormal increment from the Arkansas and White Rivers would have been approximately 60.5 feet about the end of April, whereas this stage was reached on April 21, the excess coming from the Arkansas and White waters. Without this great excess from the Arkansas Basin the stage on April 21 would have been between 57.6 and 58 feet instead of 60.5 feet. Therefore the probable crest at Arkansas City in 1927 with levees intact would have been 57.5 to 58+4 additional rise to come from Cairo plus about 7 from the Arkansas and White, or about 68.5 to 69 feet. Incidentally the crest stage at Little Rock would have been higher than the 33 feet reached on April 20, and the lower White would also have been higher.

*Greenville, Miss.*—By applying the normal difference of about 6 feet that actually prevailed between Arkansas City and Greenville, and −1 foot for banking effect at Arkansas City, we would have had for Greenville in 1927 under the conditions assumed, 68.5 to 69 feet for Arkansas City −7=61.5 to 62 feet. At Lake Providence, La., the crest would have been about 2.5 feet lower than at Greenville; that is, 59 to 59.5 feet.

*Vicksburg, Miss.*—Applying the normal difference of 3 feet between Arkansas City and Vicksburg, and minus about 1 foot for banking effect at Arkansas City, we have for Vicksburg 68.5 to 69−4=64.5 to 65 feet.

*Natchez, Miss.*—Assuming Vicksburg and Natchez crests to be approximately the same at very high stages, we obtain Natchez probable crest as 64.5 to 65 feet.

*Baton Rouge, La.*—With unbroken levees the normal difference between Natchez and Baton Rouge will be about 11 feet, but with the Red also very high, as it was in 1927, the difference would have been reduced to at least 10 feet and the crest at Baton Rouge would therefore have been 64.5 to 65−10=54.5 to 55 feet.

*Donaldsonville, La.*—At very high stages the difference between Baton Rouge and Donaldsonville is approximately 10 feet. Assuming these figures to be correct, the unimpeded crest at Donaldsonville in 1927 would have been 54.5 to 55−10=44.5 to 45 feet.

*New Orleans, La.*—Forecasts of flood stages at New Orleans must always take into consideration the possible effect of tides and wind direction and velocity. While these factors are of great importance at times, they must be disregarded in any computation of gage relations, and therefore a liberal allowance must be made as a factor of safety. It appears that with a stage of 34 feet on the Donaldsonville gage, the difference between the Donaldsonville and New Orleans crests will be approximately 14 feet, increasing gradually at the rate of 0.3 per foot as the Donaldsonville crests increase, so that with Donaldsonville at 45 feet, the difference between Donaldsonville and New Orleans (Carrollton gage), would be about 17.3 feet. Applying this difference we have 44.5 to 45−17.3=27.2 to 27.7 feet for New Orleans. These figures for New Orleans appear to be very high, and possibly the increase in the difference between Donaldsonville and New Orleans at very high stages may be a little more than 0.3 foot for each foot of rise at Donaldsonville.

MAXIMUM FLOOD POSSIBILITIES

Again the counsel of several officials of the Weather Bureau was invited, and the conclusions given below, while they are largely speculative, represent the combined judgment of those in the Weather Bureau who have given attention to the problem. Let us begin again with Paducah and Cairo. On February 14, 1884, the crest stage of the Ohio River at Cincinnati was 71.1 feet, and on April 1, 1913, 69.9 feet. The corresponding crests at Paducah were 54.2 and 54.3, and at Cairo 52 and 54.7 feet. The Mississippi at St. Louis was below 15 feet in 1884 and between 21 and 25 feet in 1913, while the stages in the tributaries of the Ohio were only moderately high in 1884 and exceptionally high in 1913. The Ohio flood

of 1884 was largely a high temperature and snow flood with only moderately heavy rains. It is not difficult to conceive of heavier rains under the same conditions with a maximum stage of at least 75 feet at Cincinnati. Under normal conditions of precipitation distribution and resultant streamflow, and without high water in the Mississippi River the crest at Paducah with 75 feet at Cincinnati would be about 57 feet and at Cairo 57.5 feet. Add to these 6 feet for a possible crest of 45 feet at St. Louis, and also about 2.5 feet additional for an excess in the Cumberland and Tennessee, not present in 1884 and 1913, and we obtain for Paducah 57+6+2.5=65.5, and for Cairo 57.5+6+2.5=66 feet. These calculations are based upon the Mississippi, Cumberland, and Tennessee Rivers contributing their tides at just the proper time to insure the greatest effect at Paducah and Cairo, an improbable occurrence, it is admitted, but nevertheless a remotely possible one.

*St. Louis, Mo.*—Flood heights in St. Louis have been raised since 1903 by the protective works at East St. Louis, Ill., how much is not known exactly, but possibly as much as 2 feet, which in 1844 would have made the flood 41.4+2=43.4 feet on the St. Louis gage. There is no record of a very great flood in 1844 in the Mississippi River as far north as Hannibal, Mo., where the highest water of record was 22.5 feet in June, 1903, nor in the northern tributaries of the Missouri River within the State of Missouri. It would be fair to allow an additional 2, or possibly 3, feet against a future flood of 22.5 feet or higher at Hannibal, and greater floods in the northern Missouri tributaries. Then we would have 43.4+2 to 3=45.4 to 46.4 feet as a possible stage for St. Louis.

*Cape Girardeau, New Madrid, and Cottonwood Point, Mo., Memphis, Tenn., and Helena, Ark.*—The maximum possible stages given in Table 10 were determined by coordinate plot from Cairo, except that at Helena an additional allowance of +0.5 foot was made for damming effect from Arkansas City, Ark.

*Arkansas City, Ark.*—Assuming a normal relation between Cairo and Arkansas City, and Arkansas and White River floods as great or a little greater than in 1927, we would obtain for the maximum flood at Arkansas City 65.5 to 66+4 for Cairo difference, +3 for additional Arkansas and White River water =72.5 to 73 feet, alarming figures, yet they appear to be reasonable in the rather improbable event that antecedent conditions proved to be most favorable. Let us remember also that a Canadian River flood, which did not occur in 1927, could easily add a foot or two to a lower Arkansas flood.

*Greenville, Miss., Lake Providence, La., Vicksburg, and Natchez, Miss.*—These stages were determined by coordinate plot from Arkansas City, except that an additional allowance of −1 foot was made for banking effect at Arkansas City.

*Baton Rouge, La.*—As stated before, with Red River in very great flood, the normal difference of about 11 feet between Natchez and Baton Rouge would be reduced at least 1 foot, and we would therefore have as the maximum for Baton Rouge 68.5 to 69 −10 =58.5 to 59 feet.

*Donaldsonville, La.*—Applying the normal difference of about 10 feet between Baton Rouge and Donaldsonville, we obtain as the maximum for Baton Rouge, 58.5 to 59 −10 =48.5 to 49 feet.

*New Orleans, La.*—Again a very indeterminate quantity, but if we assume the original possiblility of 27.2 to 27.7 feet in 1927, or even a little lower stage, it is probably not unreasonable to place the maximum possible stage at 29.5 to 30.5 feet.

We again emphasize that while the figures given in Table 7 represent only a very remote probability, they are not entirely beyond the bounds of ultimate possibility. According to Cline, the flood of 1927 surpassed any previous overflow below Vicksburg in something like 200 years, and a second 200 years, or even more, might and probably would elapse before the appearance of a flood that would be as great or greater. Time alone can determine, but it must not be forgotten that the two greatest floods of history in the lower Mississippi River occurred in 1922 and 1927, an interval of only 5 years.

The total area of lands overflowed by the flood water of 1927, as obtained by officials of the Weather Bureau, was 18,268,780 acres, or 28,545 square miles. As the river districts of the bureau are necessarily arranged without regard to State boundaries, it is impossible to properly allocate to the States concerned their proper proportions of the total acreage overflowed. However, a few individual State totals which are not absolutely correct, were as follows:

| | Acres |
|---|---|
| Tennessee | 505,000 |
| Mississippi | 5,032,000 |
| Arkansas | 4,224,000 |
| Kansas | 77,100 |
| Oklahoma | 265,000 |
| Texas | 6,000 |
| Total | 10,109,100 |

The distribution of overflowed areas by Weather Bureau river districts, which are outlined in the district reports, was as follows:

| | Acres |
|---|---|
| St. Louis, Mo | 86,400 |
| Cairo, Ill | 630,880 |
| Memphis, Tenn | 1,935,000 |
| Vicksburg, Miss | 5,032,320 |
| New Orleans, La | 6,382,080 |
| Nashville, Tenn | 23,000 |
| Little Rock, Ark | 3,648,000 |
| Shreveport, La | 157,000 |
| Fort Smith, Ark | 265,000 |
| Topeka, Kans | 77,100 |
| Missouri River above Kansas City, Mo | 50,000 |
| Total | 18,286,780 |

An estimate of the total area of crop lands flooded was prepared by the Bureau of Agricultural Economics of the United States Department of Agriculture, and the figures obtained were as follows:

| | Acres |
|---|---|
| Arkansas | 1,839,400 |
| Louisiana | 1,112,200 |
| Mississippi | 861,900 |
| Missouri | 359,000 |
| Tennessee | 195,000 |
| Kentucky | 50,000 |
| Total | 4,417,500 |

Of the total of 4,417,500 acres of overflowed crop lands, there were grown in 1926, according to the Bureau of Agricultural Economics, about 2,600,000 acres of cotton, 1,100,000 acres of corn, 360,000 acres of hay, and about 357,500 acres of other crops. Of course much of the overflowed land was afterwards replanted, but how much is not now known. However, large acreages were reoverflowed after replanting, especially in southeastern Arkansas where there were really four overflows.

The acreage of crop lands overflowed was a little more than 24 per cent of the total overflowed area, which is perhaps a little less than the usual ratio between cultivated and uncultivated lands. However, the figures for crop lands did not include the overflowed areas in Kansas, Oklahoma and some scattered acreages. Over these the total overflow on lands of every description was 415,100

acres. Deducting this amount from the total of 18,286,780 acres, there remain 17,871,680 acres, making the percentage of crop lands overflowed 24.7, about the usual ratio.

### LOSS OF LIFE IN THE FLOOD

Until the year 1927 loss of human life in lower Mississippi floods for the last 60 years at least, has been so small as to be virtually negligible. The relatively distant origin of the floods and their slow, deliberate movement permit their approach to be heralded many days in advance and there is always ample time for all affected to remove or be removed from places of danger. Owing to the natural reluctance of many of those not generously endowed with the necessities and comforts that contribute to material well being, to abandon the little they may happen to possess, it has often been necessary to remove them more or less forcibly, but nevertheless in time, as a rule, to avoid catastrophe.

During the great floods of 1897, 1903, 1912, 1913, and 1922 there were no losses of human life that were directly attributable to the flood, but the flood of 1927 proved to be a sad exception. The death statistics for this flood were compiled very carefully, and they are as follows:

| | |
|---|---|
| Cairo, Ill., district | 11 |
| State of Arkansas | 127 |
| Memphis, Tenn., district | 34 |
| State of Mississippi | 42 |
| Total | 214 |

There were also 4 lives lost on the Verdigris River at Gibson Station, Okla., 1 at Kansas City, Mo., 89 in Kentucky, and 5 in Virginia and North Carolina, making in all a total of 313. The deaths in Kentucky, Virginia, and North Carolina occurred in the mountain districts in the month of May.

### LOSS AND DAMAGE

When the time arrived to ascertain the extent of loss and damage caused by the floods and to connect them with dollars and cents, the usual difficulties arose, the same difficulties that attend any flood whether great or small. Of course the diverse and oftentimes intangible character of the damage precludes any hope of absolutely reliable statistics. For reasons that need not now be mentioned, the almost invariable tendency is to underestimate loss and damage. Nevertheless careful and conscientious endeavors were made by the officials in charge of the various river districts to obtain data of this character that would be at least reasonably reliable, and the results are given below. Except in a few instances, tabulation by individual States was not possible with the data at hand, as Weather Bureau river districts are organized without regard to State boundaries. Railroad losses, which must have been very large, are not included except in a few instances.

Detailed reports of the flood in the several river districts are presented by the following named Weather Bureau officials:

| | River district |
|---|---|
| Montrose W. Hayes | St. Louis. |
| William E. Barron | Cairo. |
| Frederick W. Brist | Memphis. |
| Robert T. Lindley | Vicksburg. |
| Isaac M. Cline | New Orleans. |
| Truman G. Shipman | Fort Smith. |
| Harvey S. Cole | Little Rock. |
| James W. Cronk | Shreveport. |

Lack of space prevents us from entering upon the full details as recited in Monthly Weather Review, Supplement No. 29, to which the reader is referred.

TABLE 8.—*Loss and damage from flood*

| District | Territory | Loss and damage | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | Miscellaneous | Crops | Livestock and other farm property | Protection work | Suspension of business | |
| Indianapolis, Ind | Indiana | $128,150 | | | | | $128,150 |
| Nashville, Tenn | Tennessee and Kentucky | 218,000 | | | | | 218,000 |
| Knoxville, Tenn | Virginia and North Carolina | 50,000 | $25,000 | | | | 75,000 |
| Louisville, Ky | Kentucky | 7,000,000 | | | | | 7,000,000 |
| Missouri River, South Dakota to Kansas City, Mo. | South Dakota, Iowa, and Nebraska | 201,500 | 797,250 | | | | 998,750 |
| Hannibal, Mo | Iowa and Missouri | 5,000 | | | | $18,000 | 23,000 |
| St. Louis, Mo | Missouri and Illinois | 4,872,000 | [1] 8,382,000 | | | 839,000 | 14,093,000 |
| Cairo, Ill | Illinois, Missouri, Tennessee, and Kentucky | 2,054,692 | 1,713,050 | $306,300 | $600,000 | 807,821 | 5,481,863 |
| Memphis, Tenn | Tennessee and Arkansas | 6,734,450 | 10,236,595 | 593,350 | 218,508 | 10,268,565 | 28,051,468 |
| Vicksburg, Miss | Mississippi and Louisiana | [2] 14,500,000 | [2] 50,000,000 | [2] 15,000,000 | [2] 15,000,000 | [2] 10,000,000 | [2] 104,500,000 |
| New Orleans, La | Louisiana and Arkansas | 30,000,000 | 22,000,000 | 6,250,000 | 15,000,000 | 28,000,000 | 101,250,000 |
| Topeka, Kans | Kansas | 418,500 | 376,000 | 73,000 | | 102,500 | 970,000 |
| Fort Smith, Ark | Kansas, Oklahoma, and Arkansas | 1,770,400 | 3,532,000 | 90,000 | | 325,000 | 5,717,400 |
| Little Rock, Ark | Arkansas | 8,336,000 | 3,654,000 | 637,000 | | 1,259,000 | 13,936,000 |
| Shreveport, La | Texas, Louisiana, Oklahoma, and Arkansas | 560,000 | 846,500 | 136,500 | | 132,000 | 1,675,000 |
| Total | | 76,898,692 | 101,562,395 | 23,086,150 | 30,818,508 | 51,751,886 | 284,117,631 |

[1] Includes livestock and other movable farm property. [2] Estimated.

TABLE 9.—*Livestock losses, by States, flood of 1927*

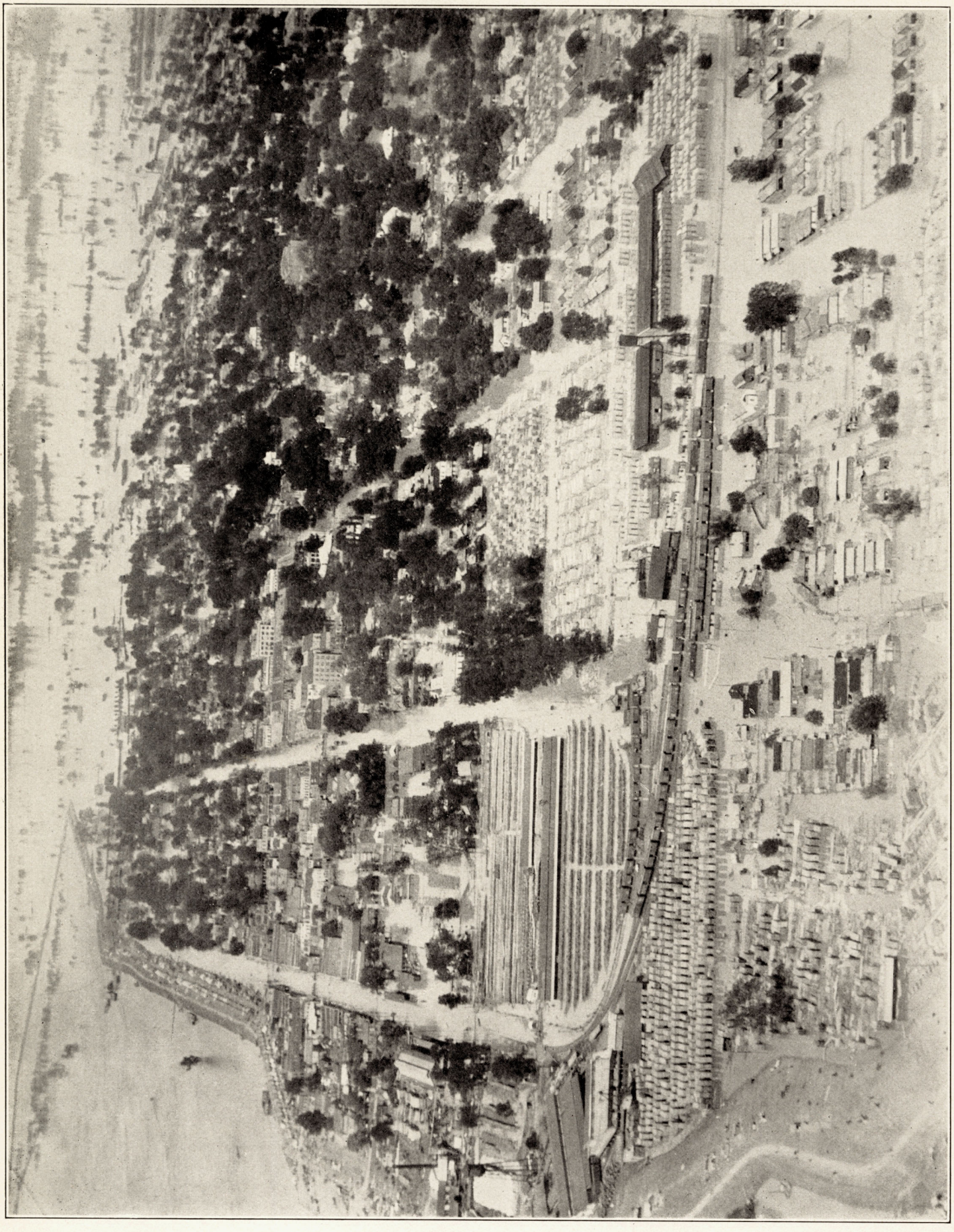
| | Arkansas | | Louisiana | | Mississippi | | Missouri | | Tennessee | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | Value | Number | Value | Number | Value | Number | Value | Number | Value | Number | Value |
| Horses and mules | 9,250 | $490,250 | 7,100 | $475,700 | 7,375 | $538,375 | 1,000 | $55,000 | 600 | $37,200 | 25,325 | $1,596,525 |
| Cattle | 21,060 | 459,108 | 19,630 | 427,934 | 9,000 | 189,000 | Slight | | 800 | 24,320 | 50,490 | 1,100,362 |
| Swine | 66,590 | 632,605 | 55,930 | 531,335 | 22,690 | 242,783 | considerable | | 2,900 | 37,700 | 148,110 | 1,444,423 |
| Sheep | 310 | 1,798 | 740 | 2,220 | 250 | 825 | Slight | | 0 | 0 | 1,300 | 4,843 |
| Poultry | 525,440 | 352,045 | 487,830 | 365,872 | 263,300 | 192,209 | Heavy | | | | 1,276,570 | 910,126 |
| Total | 622,650 | 1,935,806 | 571,230 | 1,803,061 | 302,615 | 1,163,192 | 1,000 | 55,000 | 4,300 | 99,220 | 1,501,795 | 5,056,279 |

NOTE.—No data for Kentucky.

Greenville, Miss., April 27, 1927. River stage 52.8 feet. (Airplane photograph)

(To face p. 448)

(To face p. 449)



Arkansas City, Ark., April 27, 1927. River stage 52.8 feet. (Airplane photograph)

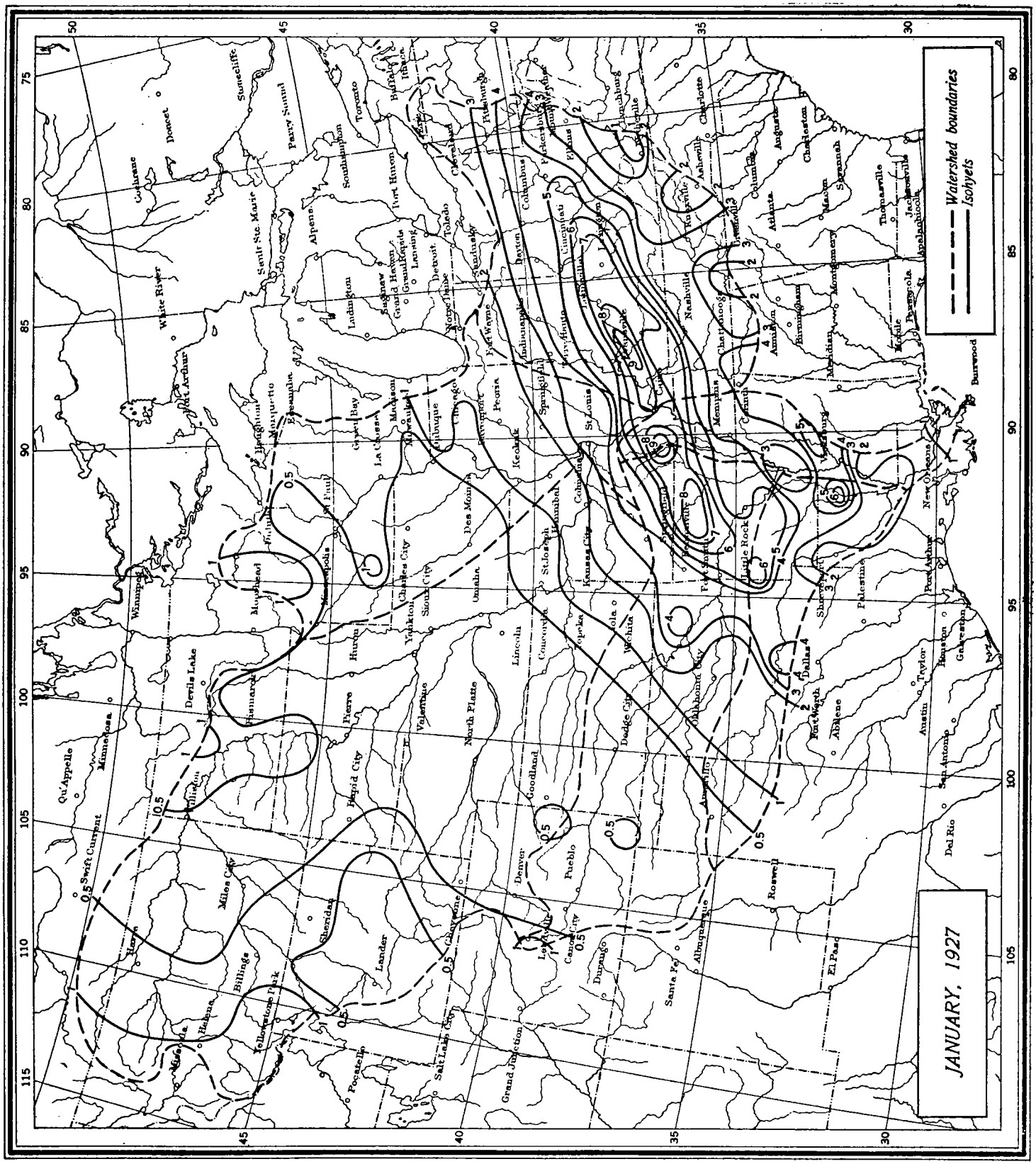



FIG. 7.—Precipitation for January, 1927

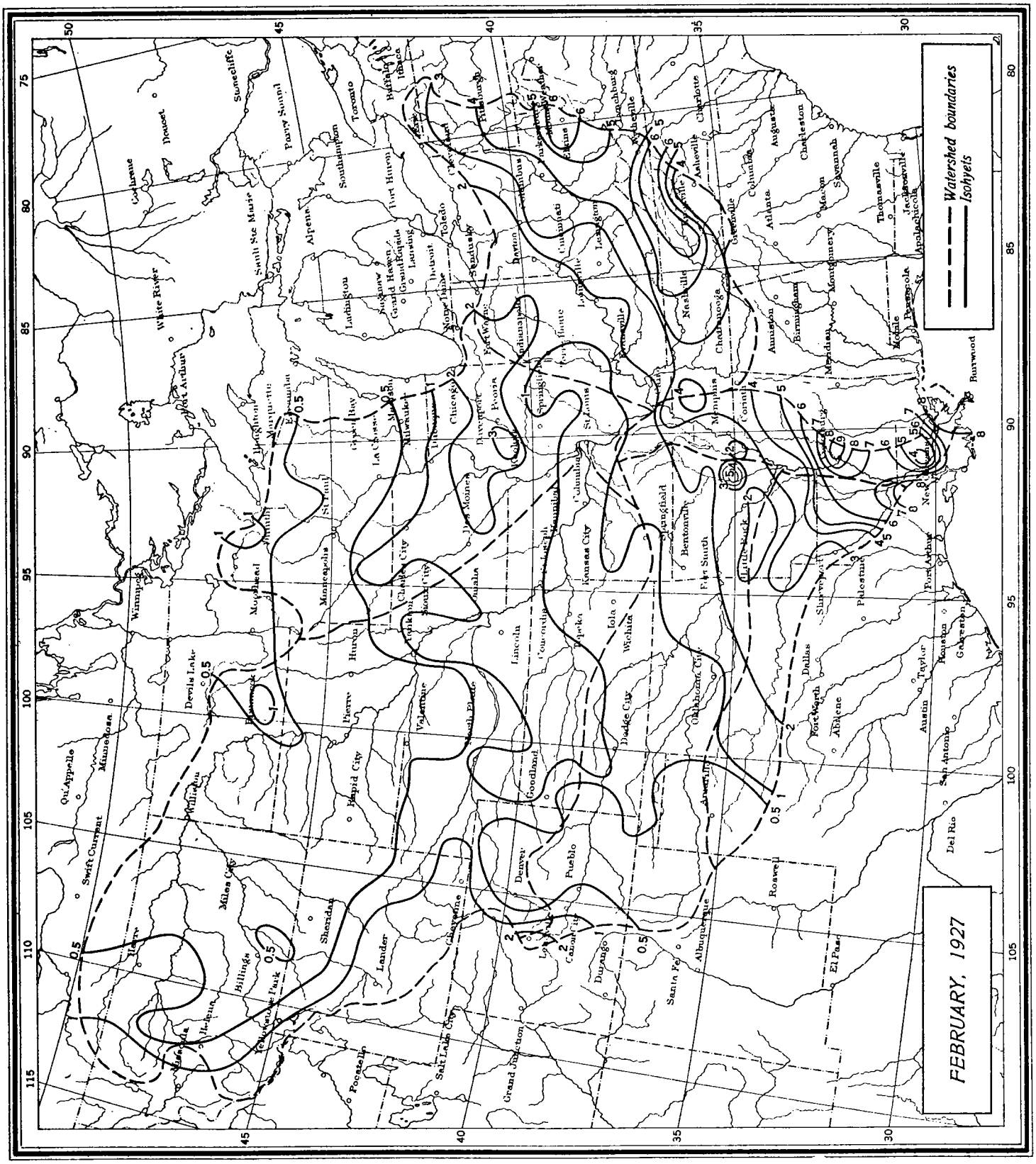



FIG. 8.—Precipitation for February, 1927

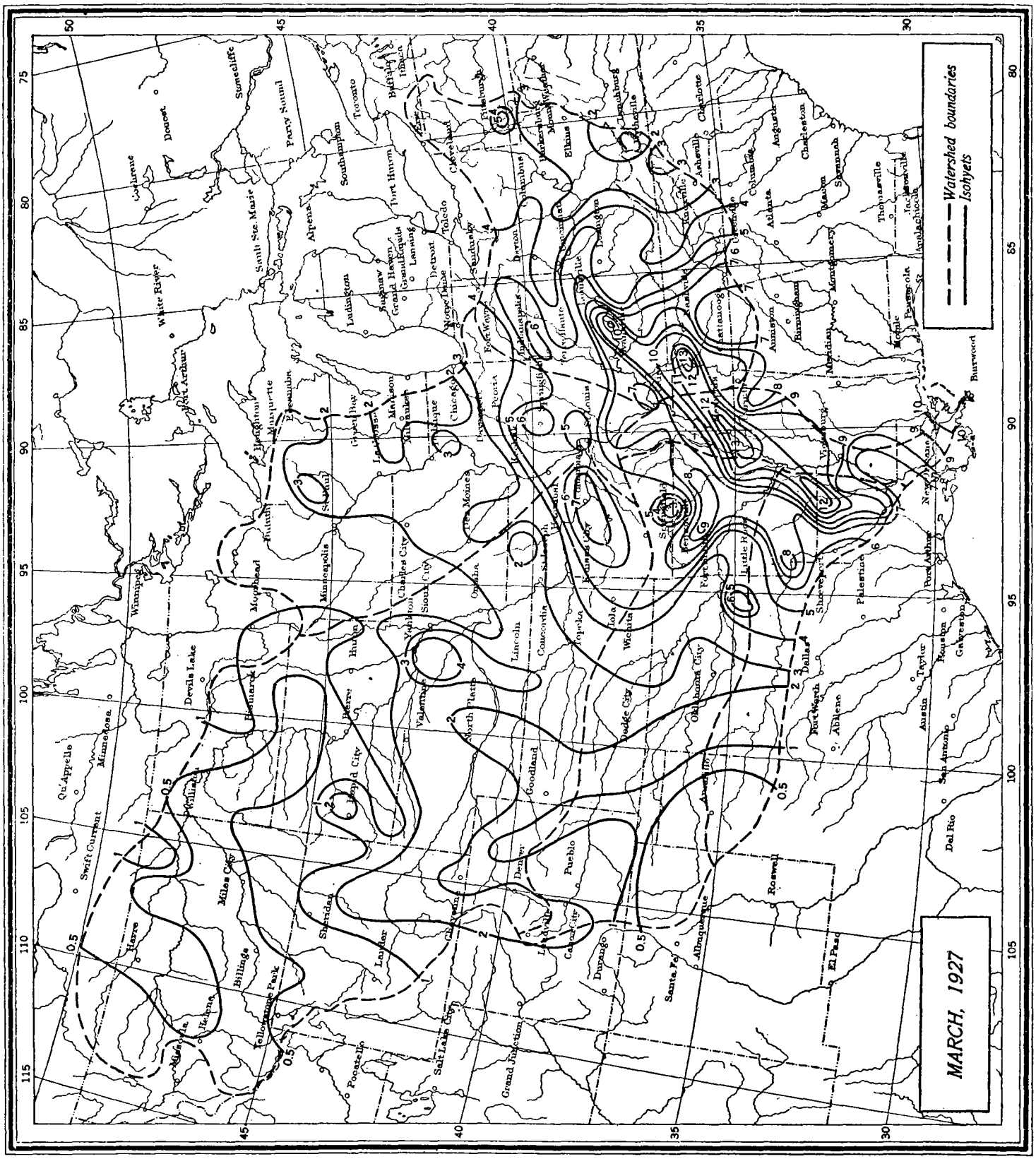



FIG. 9.—Precipitation for March, 1927

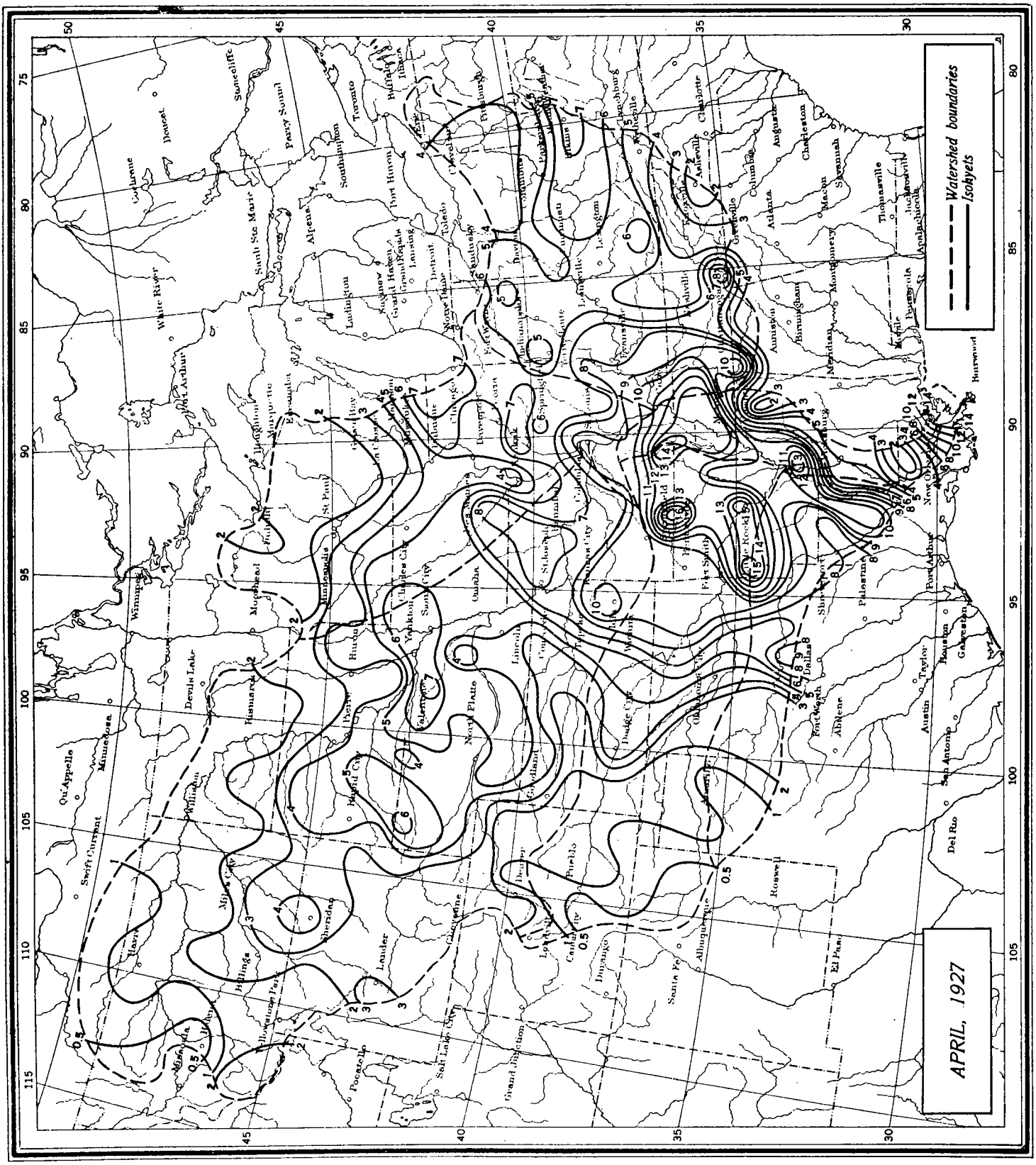



FIG. 10.—Precipitation for April, 1927